

**UNITED STATES DISTRICT COURT  
SOUTHERN DISTRICT OF NEW YORK**

---

**IN RE: METHYL TERTIARY BUTYL  
ETHER (“MTBE”) PRODUCTS  
LIABILITY LITIGATION**

---

**Master File No. 1:00–1898  
MDL 1358 (SAS)  
M 21-88**

**This document relates to:**

City of Merced Redevelopment Agency v. Exxon  
Mobil Corp., et al., 08 Civ. 06306 (SAS)

---

**DECLARATION OF DANIEL BOONE IN SUPPORT OF  
PLAINTIFF CITY OF MERCED REDEVELOPMENT AGENCY’S  
OPPOSITION TO DEFENDANTS’ MOTION FOR PARTIAL SUMMARY JUDGMENT  
RE NUISANCE AND TRESPASS**

I, Daniel Boone, hereby declare:

1. I am one of the attorneys in this case for plaintiff City of Merced Redevelopment Agency. I have been personally involved in much of the discovery and pretrial proceedings in this action. This Declaration is based on my personal knowledge and, if called as a witness, I could testify competently thereto.

2. Attached hereto as Exhibit 1 is a true and correct copy of excerpts from the deposition of Joel Masticelli taken July 26, 2000, in *South Tahoe Public Utility District*.

3. Attached hereto as Exhibit 2 is a true and correct copy of a Memorandum dated June 11, 1986, to O.T. Buffalow, San Francisco, CA, from D.W. Callahan.

4. Attached hereto as Exhibit 3 is a true and correct copy of a Memorandum re MTBE dated December 30, 1986.

5. Attached hereto as Exhibit 4 is a true and correct copy of Ultramar Material Safety Data Sheet dated June 30, 1994.

6. Attached hereto as Exhibit 5 is a true and correct copy of an August 12, 1991, Memorandum, TIP Letter #237, MTBE Effects [CHEV 09564-09567.]

7. Attached hereto as Exhibit 6 is a true and correct copy of Memorandum, Chemical Entry Review for MTBE, dated March 26, 1991.

8. Attached hereto as Exhibit 7 is a true and correct copy of an Email from C. Stanley to D. McGill dated July 14, 1993.

9. Attached hereto as Exhibit 8 is a true and correct copy of Memo re MTBE in Ground Water Issue dated April 27, 1995.

10. Attached hereto as Exhibit 9 is a true and correct copy of an Email dated May 14,

1998, from C. Stanley to K. Bell.

11. Attached hereto as Exhibit 10 is a true and correct copy of an Email dated November 3, 1998, from C. Stanley to J. Pedley.

12. Attached hereto as Exhibit 11 is a true and correct copy of MTBE Release Source Identification at Marketing Sites dated March 30, 1999.

13. Attached hereto as Exhibit 12 is a true and correct copy of an email dated January 20, 1999, from Hugh Dickey to multiple recipients attaching "Solving Problems from MTBE Contamination - It's Not Just Regulating Underground Tanks."

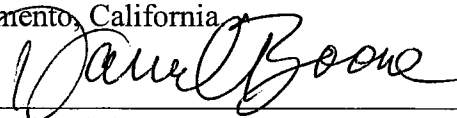
14. Attached hereto as Exhibit 13 is a true and correct copy of an Email dated February 2, 1999, from C. Stanley to F. Benton.

15. Attached hereto as Exhibit 14 is a true and correct copy of an Email dated May 29, 1998, from G. Marshall to C. Stanley.

16. Attached hereto as Exhibit 15 is a true and correct copy of an Email dated March 12, 1999, from G. Marshall to C. Stanley.

I declare under penalty of perjury that the foregoing is true and correct.

Executed this 7<sup>th</sup> day of May, 2013, at Sacramento, California

  
DANIEL BOONE

# **EXHIBIT 1**

IN THE SUPERIOR COURT OF THE STATE OF CALIFORNIA  
IN AND FOR THE COUNTY OF SAN FRANCISCO

--o0o--

SOUTH TAHOE PUBLIC UTILITY  
DISTRICT,

Plaintiff,

vs

ATLANTIC RICHFIELD COMPANY  
("ARCO"); ARCO CHEMICAL COMPANY;  
SHELL OIL COMPANY; CHEVRON  
U.S.A., INC.; EXXON CORPORATION;  
B.P. AMERICA, INC.; TOSCO  
CORPORATION; ULTRAMAR, INC.;  
BEACON OIL CO.; USA GASOLINE  
CORPORATION; SHELL OIL PRODUCTS  
CO.; TERRIBLE HERBST, INC.;  
ROTTEN ROBBIE; J.E. TVETEN  
CORP.; TAHOE TOM'S GAS STATION;  
THE SOUTHLAND CORP.; PARADISE  
CHEVRON; and DOES 1 through 600,  
inclusive,

Defendants.

No. 999128  
THIS TRANSCRIPT  
CONTAINS  
CONFIDENTIAL  
MATERIALS

--o0o--

WEDNESDAY, JULY 26, 2000  
10:07 A.M.

--o0o--

DEPOSITION OF  
JOEL MASCITELLI

--o0o--

CATHLEEN SLOCUM, CSR  
License No. 2822

1 product specifications for the company. So I'm sure  
2 that he may have had some responsibility at that time.

3 Q At the time you left the company, were these  
4 three gentlemen still employed by Ultramar?

10:33:00 am 5 A Yes, they were.

6 Q As far as you know are they still employed by the  
7 company?

8 A I believe they, all three of them still are.

9 Q Prior to 1996, and let's take the 1990 through  
10 1996 time period, was Ultramar a member of the  
11 American Petroleum Institute?

12 A We were a member, and I don't remember the exact  
13 year, up until sometime in -- it could have been, you  
10:33:30 am 14 know, right after the IPO which was in '92. '93, '94  
15 we dropped our membership in the API.

16 Q And was there a particular reason why the  
17 membership was dropped?

18 A Cost.

19 Q Was the American Petroleum Institute a source of  
20 information regarding other gasoline companies'  
21 experiences with gasoline in terms of environmental  
10:34:00 am 22 fate?

23 A They were one of the sources, yes.

24 Q And just so I'm clear, Ultramar stopped becoming  
25 a member of American Petroleum Institute in

1 approximately 1992 because of cost?

2 A Yeah, '92, '93. Cost and the fact that we felt  
3 that we were getting similar type information from  
4 other associations.

5 Q All right. And what other associations would  
6 those be?

7 A The main one was the NPRA, National Petroleum  
10:34:30 am 8 Refiners Association, and then there was also a West  
9 Coast association. I believe it was WSPA, Western  
10 States Petroleum Association.

11 Q And when was Ultramar a member of the NPRA?

12 A They were, they've been a member, you know, from  
13 when I started with the company until when I left.

14 Q Okay. And how long has Ultramar been a member of  
10:35:00 am 15 WSPA?

16 A My recollection would be they probably were,  
17 became a member after the acquisition of the  
18 Wilmington refinery which was in '89. I mean, excuse  
19 me, prior to that they could have been an associate  
20 member, but I don't remember that.

21 Q And did the NPRA generate materials that it  
10:35:30 am 22 shared with members regarding the environmental fate  
23 of gasoline?

24 A The NPRA shares materials on environmental  
25 matters, gasoline and otherwise, yes.

1 testified earlier that Ultramar was also involved in  
2 the retail gasoline business at the time?

3 A Yes.

4 Q As part of the choice of oxygenates, was any  
5 consideration given to the underground storage tanks  
6 at the retail facilities in terms of the choice of  
7 oxygenates?

11:01:30 am

8 A No.

9 Q Was there any, in conjunction with this  
10 decision-making process on the choice of oxygenates,  
11 was any program instituted regarding tank upgrades or  
12 tank inspections of any sort?

11:02:00 am

13 A Well, at that same period of time the company was  
14 upgrading all of their underground storage tanks and  
15 their retail stations to meet, you know, a deadline  
16 when you were supposed to have these, you know, there  
17 was a deadline. I can't remember what it was. It  
18 could have been sometime in '98, '99. But we were  
19 upgrading, basically on a program to upgrade all of  
20 the underground storage tanks to meet the new  
21 regulations.

11:02:30 am

22 Q And you think that this program culminated either  
23 in 1998 or 1999?

24 A I believe so. And I think -- and, again, it's my  
25 recollection that we were, you know, somewhere like 60

40



1 to 70 percent done when I left the company in '97.  
2 And I know that at that point in time we were  
3 essentially ahead of the program as far as the number  
4 of sites we needed to get done on a yearly basis.

5 Q So when you left the company in 1977, taking the  
11:03:00 am 6 converse of what you said, approximately 30 to 40  
7 percent of the Ultramar retail stations had not yet  
8 had their underground storage systems upgraded?

9 A Yeah, they would be less than 30 percent.

10 Q Less than 30 percent but more than 25 percent?

11 A Hell, again, it's somewhere in that range.

12 Q All right. And do you know what type of storage  
11:03:30 am 13 tanks were being installed to meet the California  
14 government regs which required upgraded storage tank  
15 facilities at retail stations?

16 A I'm pretty sure that in all sites that we were  
17 working on we were going to double-walled tanks.

18 Q Do you know if the upgraded -- well, did  
11:04:00 am 19 Ultramar own a number of its own stations?

20 A Yes, they did.

21 Q When I say own, that means they own the site  
22 where the gas station was located?

23 A I believe in most of the cases they owned the  
24 land where the station was located, yes.

25 Q And that would also include obviously the

1 A Yes.

2 Q From 1996 until you retired from the company, are  
3 you aware of any program by Ultramar that required  
11:10:00 am 4 independent dealers that purchased gasoline from  
5 Ultramar to certify that their tanks weren't leaking  
6 to Ultramar prior to a purchase of gas from Ultramar?

7 A I was not aware of that, no.

8 Q Are you aware of any program at Ultramar to  
9 determine if the non-branded stations receiving  
10 Ultramar gas after 1996 in California -- strike that  
11:10:30 am 11 question.

12 Do you know if Ultramar after 1996 in  
13 California had any program to inspect unbranded  
14 stations that received Ultramar gasoline in terms of  
11:11:00 am 15 whether they had any leaks in their underground  
16 storage tank systems?

17 A No, I was not aware of any.

18 Q Now, going back to the decision-making analysis  
19 that was undertaken when Ultramar was determining  
20 which oxygenate to select, do you know if any members  
11:11:30 am 21 of Ultramar ever asked ARCO Chemical to discuss their  
22 experiences with MTBE in terms of its environmental  
23 fate?

24 A I'm not aware of any, any requests, no.

25 Q Do you recall as you sit here today ever seeing

11:16:30 am 1 an oxygenate in 1996?

2 A No, I'm not.

3 Q Did you attempt to contact anybody at Shell to  
4 discuss their experience with the use of MTBE in  
5 gasoline --

6 A No.

7 Q -- prior to 1996?

8 A No, I did not.

9 Q Do you know of anybody at Ultramar that attempted  
10 to contact anybody at Shell regarding their experience  
11 with MTBE in gasoline prior to 1996?

11:17:00 am

12 A No.

13 Q Are you aware of anybody at Ultramar that  
14 attempted to contact anybody at ARCO regarding its  
15 experience with MTBE in conjunction with the  
16 decision-making process to use MTBE in 1996?

17 A No, I'm not.

18 Q Did Ultramar engage in any independent research  
19 regarding the environmental fate of MTBE before it  
20 decided to use it as an oxygenate in gasoline?

11:17:30 am

21 MS. MILNER: Objection. Asked and answered.

22 MR. SAWYER: Go ahead, sir.

23 THE WITNESS: Did we do independent research?

24 MR. SAWYER: Q Yes, sir, in-house research.

25 A No, we did not.

11:18:00 am 1 Q In conjunction with the Environmental Impact  
2 Report with respect to the Wilmington refinery  
3 modifications when you were going to go to MTBE, do  
4 you know if Ultramar did any independent in-house  
5 analysis of the environmental effects of MTBE as part  
6 of the EIR process?

7 MS. MILNER: Objection. Misstates the  
8 witness' prior testimony. He testified that the  
9 construction and the permitting was done for, not for  
11:18:30 am 10 MTBE but for the CARB RFG requirements.

11 MR. SAWYER: That's a point.

12 Q Was any environmental impact analysis done with  
13 respect to the use of or the introduction of MTBE at  
14 the Wilmington refinery?

15 A Not that I'm aware of unless -- I mean, here  
16 again, --it potentially could have been required under  
17 the Environmental Impact Report but I wasn't aware of  
18 an independent study.

11:19:00 am 19 Q So you're not sure whether or not it was included  
20 as part of the Environmental Impact Report?

21 A No, I'm not.

22 Q When MTBE was first introduced into gasoline and  
23 Ultramar at its Wilmington refinery facility, was  
24 there any analysis undertaken as to whether any  
25 warning should accompany the sale of the gasoline?

11:19:30 am 1 A Again, it would fall under the regulations as far  
2 as any kind of product labeling requirements that were  
3 required at that time. And so if there, if there was  
4 a requirement to have the products labeled  
5 appropriately, I mean, you know, with the use of MTBE,  
6 then I'm sure that we would have followed that.

7 Q Just so I'm clear on your testimony then, if the  
11:20:00 am 8 government required Ultramar to issue a warning, then  
9 they'd issue a warning, but they weren't going to do  
10 any warnings on their own; is that correct?

11 A Correct.

12 MS. MILNER: Objection. Argumentative.

13 MR. SAWYER: Did you get the answer,  
14 "Correct"? All right. Thank you.

15 Q In conjunction with the decision-making process  
11:20:30 am 16 of selecting the oxygenate to use to meet CARB  
17 requirements, were there any discussions regarding the  
18 affects of MTBE on groundwater?

19 MS. MILNER: I'm sorry, could I ask the  
20 court reporter to repeat that.

21 MR. SAWYER: Absolutely.

22 MS. MILNER: Thanks.

23 (Thereupon the record was read back.)

24 THE WITNESS: I don't remember any specific  
11:21:00 am 25 discussions about that, no.

1 MR. SAWYER: Q Do you have any recollection  
2 whatsoever regarding that particular subject matter  
3 coming up during the decision-making process?

4 A No, I don't.

5 Q At some point after the decision was made to use  
11:21:30 am 6 MTBE at the Wilmington refinery and to the point that  
7 you retired from the company, do you recall any  
8 discussions regarding the effects of MTBE on  
9 groundwater?

10 A No.

11 Q From the point that Ultramar first used MTBE as  
11:22:00 am 12 an oxygenate at the Wilmington refinery until the  
13 point you retired, do you recall whether or not there  
14 were any meetings at which the subject of MTBE  
15 groundwater contamination was discussed?

16 A I don't remember any. No, I don't.

17 Q Now, you indicated that Ultramar relied on what  
11:22:30 am 18 you called its outside experts to, on the issue of  
19 choice of oxygenates and its impact on the  
20 environment. Do you recall ever reviewing any  
21 literature from any of the organizations that Ultramar  
22 belonged to regarding the effects of MTBE on  
23 groundwater?

24 A I don't remember any, receiving anything on  
11:23:00 am 25 that.

CERTIFICATE OF CERTIFIED SHORTHAND REPORTER

I, CATHLEEN S. SLOCUM, a Certified Shorthand Reporter, in and for the State of California, duly appointed and commissioned to administer oaths, do hereby certify:

That I am a disinterested person herein; that the witness, JOEL MASCITELLI, named in the foregoing deposition, was by me duly sworn to testify the truth, the whole truth, and nothing but the truth; that the deposition was reported in shorthand by me, Cathleen S. Slocum, a Certified Shorthand Reporter of the State of California, and thereafter transcribed into typewriting.

IN WITNESS WHEREOF, I have hereunto set my hand as a Certified Shorthand Reporter on this 31 of July, 2000.

*Cathleen Slocum*

Cathleen Slocum  
Certified Shorthand Reporter  
License Number 2822

--o0o--

# **EXHIBIT 2**



Memorandum

San Francisco, CA  
June 11, 1986

MARKETING ENVIRONMENTAL  
CONCERNS REGARDING  
THE USE OF MTBE IN MOGAS

MR. O. T. BUFFALOW:

We are currently involved in the cleanup of an aquifer in Maryland contaminated by several different company's leaking underground storage tanks. The companies involved, including Gulf, were utilizing MTBE (Methyl Tertiary Butyl Ether), a motor gasoline octane improver. The EPA has shown great interest in the removal of MTBE from this contaminated aquifer. A literature study by the API has shown that MTBE, and the related octane enhancer IPE (Isopropyl Ether), have several disturbing properties. Both MTBE and IPE:

- o have relatively high solubilities in water - an order of magnitude higher than BTX (Benzene, Toluene, Xylene)
- o have relatively high mobility in the subsurface - will move to the leading edge of a contamination plume
- o have low odor and taste thresholds in water
- o are relatively stable with respect to biodegradation
- o are expensive to remove from water - air stripping is required with follow-up treatment probably necessary to attain the extremely low discharge concentrations likely to be mandated by a governmental agency

We understand that Chevron currently utilizes MTBE at Port Arthur extensively and to a lesser extent in Pascagoula. We further understand that MTBE is anticipated to be used at some other Chevron refineries as the EPA mandated lead-phasedown continues to impact octane requirements. This projected increase in MTBE utilization concerns Marketing for two major reasons:

- o MTBE utilization could increase the cost to clean up leaks at service stations and terminals; and
- o MTBE could become a significant constituent of mogas storage water-draws and attract regulatory attention to Marketing terminal effluent. Marketing terminals generally route effluent through a simple API separator and have no facilities to treat or reduce dissolved component contamination.

MR. O. T. BUFFALOW

- 2 -

June 11, 1986

Please let us know what refineries are currently using MTBE or IPE. Although we expect usage varies with operating necessities at the refineries, please let us know which blends generally utilize MTBE/IPE and at what average concentrations. Please let us know what your future plans are with respect to these additives.

Thank you for your cooperation.

D. W. CALLAHAN

JK:J-2

cc: Mr. R. W. Krewtzen - Please let us know if you are aware of any Chevron NPDES permits with MTBE limits, or expect future regulatory activity in this area.

Circulating File - 2500

# **EXHIBIT 3**

Memorandum

San Francisco, CA  
December 30, 1986

MTBE

MR. R. L. ARSCOTT:

Chevron USA Downstream has used MTBE in gasoline for a number of years. Future use as an octane enhancer is likely to increase; and government actions may stimulate additional use to reduce CO emissions from motor vehicles and/or to reduce the aromatics in gasoline. We are currently evaluating the economics of building an MTBE plant.

Recently, we have learned of concerns about potential adverse health and environmental effects of MTBE. For example, the attachments indicate that:

- The U.S. Interagency Testing Committee has recommended chronic inhalation toxicity testing with monitoring of concentrations at terminals and service stations, and
- The Maine Department of Environmental Protection has recommended either banning MTBE or imposing special storage requirements to protect groundwater.

Marketing has also heard of some concern in Europe that may spill over to the U.S.

We would appreciate your assessment of available information concerning health and environmental effects of MTBE and of the potential for additional government limitations on the use of MTBE in gasoline.

D. B. SMITH

Original Signed by  
DIXON B. SMITH

Original Signed by  
M.A. JAVINSKY

BB:jsc

cc: Mr. C. L. Blackwell  
Mr. O. T. Buffalow  
Mr. D. W. Callahan  
Mr. R. D. Cavalli  
Mr. H. S. Quillicy  
Mr. E. E. Spitler  
Mr. R. W. Yose

bcc: JPG  
MAJ  
WBR  
WHL  
DAB✓

CH 009137

# Alcohol Week

CHEVRON CORPORATION  
BELLINGHAM, WASH.

Washington  
Publication

An exclusive report on alcohol fuels and feedstocks

LIBRARY Vol. 1 No. 47 December 8, 1986

## MAINE CALLS FOR DROPPING MTBE: CITES IT AS GROUNDWATER CONTAMINANT

A report detailing the hazards of methyl tertiary butyl ether (MTBE) as a groundwater contaminant has just been released by the Maine Dept. of Environmental Protection. According to the report, MTBE is not highly toxic but does spread through an aquifer more rapidly than other gasoline components, thereby contaminating the residual gasoline while contaminating drinking wells beyond the radius where gasoline would normally reach. The report concludes that MTBE should either be banned from addition to gasoline or at least stored in extra-secure containers.

MTBE was found to be soluble in water at 4.3%, compared to the relative insolubility of benzene at 0.18%, toluene at 0.05% and xylene at 0.12%. Since benzene, toluene and xylene are more soluble in ethers than in water they, along with the larger hydrocarbon molecules of gasoline, tend to linger and concentrate while the MTBE rushes into fresh water supplies, the report says.

Although Maine has set a maximum contaminant level for MTBE at 50 parts per billion (ppb), concentrations of 590 ppb were discovered in a drinking well near a gasoline/MTBE blend spill. At that site, *(continued on page 7)*

the concentration of other volatile components was only 10 ppb. The well near the spill had concentrations of up to 125,000 ppb gasoline plus MTBE, the report states. At another site, total concentrations exceeded 600,000 ppb in contrast to usual maximum concentrations for gasoline components near spills of only 10-20,000 ppb. The point is that MTBE not only leads other hydrocarbons through the aquifer but, as it spreads away, concentrates the remaining hydrocarbons, one of the authors said.

"Groundwater contaminated with MTBE is difficult to remediate," the report states. Carbon filtration is not as effective for MTBE since it is not adsorbed as well as other gasoline components. Carbon filtration is not as effective for MTBE since it is not adsorbed as well as other gasoline components. Carbon filtration is not as effective for MTBE since it is not adsorbed as well as other gasoline components.

The report states that MTBE, now one of the top 50 chemicals produced in the U.S., is a very popular oxygenate in lieu of lead. Some 30 plants now produce MTBE; Texas Petrochemicals and ARCO are the largest producers. An additional 20 plants are planned, the report states. Of the U.S., 60,000 barrels/day MTBE production, 95% originates in Texas. MTBE was first produced by ARCO in

the 1960s when the company patented a process for removing branched olefins like isobutylene from hydrocarbon streams, the report states. The isobutylene is then combined with methanol. MTBE was not commercially produced until 1979 and production has increased by about 40% each year since 1980, the report states. It is currently used in about 10% of the U.S. gasoline supply but the proportion of gasolines blended with MTBE is expected to increase dramatically in coming years. Although the U.S. Environmental Protection Agency allows blending up to 11%, it is usually added at between 2% and 7% and mostly in unleaded premium gasolines.

Claims made about MTBE are that it has an octane blending value greater than that of toluene, reformate or alkylate; is compatible with all types of automobile materials; does not phase-separate as alcohols do; and that its use in gasoline reduces carbon monoxide and hydrocarbon emissions in most cars, the report states.

Not only does MTBE's greater solubility and lower ability to stick with soil and biological particles mean that its plume around a leak is greater than that of other gasoline components, but it also acts as a cosolvent for the gasoline components, thereby dragging them along behind, the report says. "The result is that the sum total of all dissolved gasoline components in groundwater is increased."

Although MTBE is not particularly toxic and is not carcinogenic, it has a "terpene-like" or "chemical" odor. "Our first contamination case, in 1984, was initially mistaken for one of hazardous waste leachate because of the unusual smell," it states. The odor can be detected at water concentrations as low as 20-50 ppb, the report states. Years after a spill, most of the plume will be only MTBE as the other gasoline components are biodegraded.

The report gives four reasons for concern over the toxicity of MTBE and its presence in domestic well water: it is very mobile in groundwater so that its concentration in a well may vary radically from week to week; plumes of MTBE in groundwater are associated with plumes of gasoline with its more varied and toxic components; MTBE is an irritant; and MTBE is probably a nervous system depressant like other ethers, and benzene, toluene and xylene.

MTBE is not the only villain when it comes to gasoline spills, however, the source said. The report offers three approaches regarding the MTBE problem, some of which would indirectly indict other gasoline additives including ethanol and methanol. Firstly, the report states that there is reason enough to call for the abandonment of MTBE as an additive in gasoline stored underground. Similarly, other octane enhancers including ethanol, methanol, and tertiary butyl alcohol may be equally soluble and have similar environmental effects to MTBE. Secondly, if MTBE use must continue, it by itself and when blended in gasoline should be stored only in double-contained facilities.

CH009138

Legal Retention at MSXSOC

From: Marshall GR (Glen) at MSXSOPC  
 Sent: Friday, May 29, 1998 5:38 PM  
 To: Stanley CC (Curtis) at MSXVHWTC  
 Chtoloni C. Wayne [STAR]  
 Subject: RE:

Way (Shell) are also moving on said focus. "Achilles Heel" of systems has always been the "Bubba-factor" ..... the best installations of hardware manufacturers and designers being ultimately defeated by poor installation and maintenance practices. Have been working last 2 years with Oy U-Cont (Varkaus, Finland) and Trusco Tanks (Fresno, CA) on a modular UST system manufactured in a factory (controlled environment) by properly trained personnel under constant supervision and inspection. Initial evaluations indicate a significantly more reliable system installed with roughly 20%+ savings in total project time and costs (related to UST portion of project). LA City Fire loved concept. Have two projects under permits in LA Basin now. Coupled with our "Compliance Management Concept" (Veeder-Root Simplicity), overall concept could provide significant movement towards what UST system operation should have been all along. Advise if further concept details desired.

Gen R. Marshall, P.E.

Staff Engineer  
 Marketing Engineering  
 Shell Oil Products Company  
 MSX 1138

Office: (713) 241-1452  
 Home: (713) 241-7166  
 Pager: (800) 342-4033  
 Shell ELS: EM10138 @ MSXSOPC  
 E-mail: gmarshall@shellus.com

-----Original Message-----

From: Stanley CC (Curtis) at MSXVHWTC  
 Sent: Friday, May 29, 1998 9:03 AM  
 To: Marshall GR (Glen) at MSXSOPC  
 Subject: FW:

Glen,

I told API that they had better have a project on slate to evaluate existing systems and new system design, installation, and operations. I already have a good idea what Santa Clara is going to find and if the industry isn't ready with an adequate response/solution, we are all going to look bad. I foresee many agencies requiring extensive groundwater monitoring systems to evaluate whether or not MTBE is being released into the environment, especially in environmentally sensitive areas (near wells, fractured bedrock, etc.).

Curtis C. Stanley

Environmental Technology Directorate - Soil and Groundwater

Westhollow Technology Center

(phone-@) 281-544-7675 (fax-@) 281-544-8727

e-mail: cstanley@shellus.com

(This communication per applicable agreements between our respective companies.)

-----Original Message-----

From: Judy Shaw [SMTP:shaw@api.org] <mailto:SMTP:shaw@api.org>  
 Sent: Friday, May 29, 1998 8:57 AM  
 To: Al Jessei; Brian Hammy; C. Fairbrother; Carol Fairbrother; Curt Stanley; Dave Peirce; David Smith; Don Gilson; Eric Vogt; Gene Mancini; Georgia Callahan; Gerry Raabe; Gweneyette Broussard; James Rocco; Jeff Sickenger; Jim Stevenson; John Taunton; Lee Hoffman; Mark Saperstein; Mary Kate Kell; Mike Lobue; Mike Wang; Ned Sepp; Ron Benton; Tim Buscheck; William Doyle  
 Cc: Alexis Steen; Bill Bush; Bill Frick; Bob Greco; bruce bauman; Carol Henry; Chuck Krambuhl; David Deal; David Lax; Debi Tulou; Dee Gavora; Eldon Rucker; Howard Feldman; Jim Williams (MDM); Karen Inman; Kim Ashton; Larry Magni; Marc Meteyer; Martha Jordan; Molly Sinclair; Rick Brown; Robert Barter; Ron Chittim; Theresa Pugh; Tom Lareau; Valerie Ughetta  
 Subject:

You need to look at the following; it relates to the source identification / protection discussion we had the other day.

SH 032897

# **EXHIBIT 4**

## MATERIAL SAFETY DATA SHEET

ULTNA163

Page 001 of 015

## SECTION 1 CHEMICAL PRODUCTS &amp; COMPANY IDENTIFICATION

ULTRAMAR, INC.  
SAFETY AND LOSS CONTROL DEPARTMENT  
24-HOUR EMERGENCY TELEPHONE NUMBER

P.O. BOX 93102  
LONG BEACH, CALIFORNIA 90809-3102  
(310) 491-6795 OR (310) 435-5832

SUBSTANCE: UNLEADED GASOLINE WITH MTBE

TRADE NAMES/SYNONYMS:  
ULTNA163

CHEMICAL FAMILY:  
Mixture

CREATION DATE: 02/16/93

REVISION DATE: 06/30/94

## SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

COMPONENT: GASOLINE, AUTOMOTIVE, UNLEADED  
CAS NUMBER: 8006-61-9  
PERCENTAGE: 85-90

COMPONENT: METHYL TERT-BUTYL ETHER  
CAS NUMBER: 1634-04-4  
PERCENTAGE: 10-15

COMPONENT: BENZENE  
CAS NUMBER: 71-43-2  
PERCENTAGE: >0.1

## SECTION 3 HAZARDS IDENTIFICATION

CERCLA RATINGS (SCALE 0-3): HEALTH=3 FIRE=3 REACTIVITY=0 PERSISTENCE=1  
NFPA RATINGS (SCALE 0-4): HEALTH=2 FIRE=3 REACTIVITY=0

## EMERGENCY OVERVIEW:

Clear, colorless to amber, aromatic, volatile liquid.

Cancer hazard (contains material which can cause cancer in humans). Risk of cancer depends on duration and level of exposure. Causes respiratory tract, skin and eye irritation. May cause blood disorders. May cause convulsions. May damage nerves. May affect the central nervous system. May cause adverse reproductive effects. May cause brain damage. May cause hearing loss. May affect the heart. May affect the kidneys. May affect the liver. May damage the lungs. May cause visual disturbances. Flammable liquid and vapor. May cause flash fire.

Do not breathe vapor or mist. Do not get in eyes, on skin, or on clothing. Keep away from all ignition sources. Keep container tightly closed. Wash thoroughly after handling. Use only with adequate ventilation. Handle with caution.

POTENTIAL HEALTH EFFECTS:  
INHALATION:

U 033815



ULTNA163 Page 002 of 015

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include paleness, flushing, ringing in the ears, lack of appetite, nausea, vomiting, difficulty speaking, difficulty swallowing, chest pain, difficulty breathing, irregular heartbeat, headache, weakness, drowsiness, drunkenness, feeling of well-being, confusion, disorientation, nervousness, restlessness, sleeplessness, numbness, twitching, visual disturbances, suffocation, lung damage, blood disorders, nerve effects, paralysis, convulsions, shock, unconsciousness and coma.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, weight loss, low blood pressure, loss of memory, hearing loss, bruising, kidney damage, nerve damage and brain damage may occur. May also cause reproductive effects and cancer.

**SKIN CONTACT:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include blisters, blood in the urine, low blood pressure, lung damage and kidney damage.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, burns, tingling sensation and nerve effects may occur.

**EYE CONTACT:**

**SHORT TERM EFFECTS:** May cause irritation. Additional effects may include spastic winking.

~~**LONG TERM EFFECTS:** In addition to effects from short term exposure, cataracts may occur.~~

**INGESTION:**

**SHORT TERM EFFECTS:** May cause gastrointestinal irritation. Additional effects may include coughing, paleness, flushing, fever, nausea, vomiting, diarrhea, chest pain, difficulty breathing, irregular heartbeat, headache, weakness, drunkenness, feeling of well-being, confusion, disorientation, nervousness, restlessness, excitation or drowsiness, twitching, visual disturbances, bluish skin color, suffocation, lung damage, liver damage, paralysis, convulsions, unconsciousness, coma and heart failure.

**LONG TERM EFFECTS:** In addition to effects from short term exposure, anemia and impotence may occur. May also cause reproductive effects and cancer.

**CARCINOGEN STATUS:**

OSHA: Y

NTP: Y

IARC: Y

-----  
**SECTION 4**

**FIRST AID MEASURES**  
-----

**INHALATION:**

**FIRST AID-** Remove from exposure area to fresh air immediately. Perform artificial respiration if necessary. Maintain airway, blood pressure and respiration. Keep warm and at rest. Treat symptomatically and supportively. Get medical attention immediately. Qualified medical personnel should consider administering oxygen.

**SKIN CONTACT:**

**FIRST AID-** Remove contaminated clothing and shoes immediately. Wash with soap or mild detergent and large amounts of water until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

**EYE CONTACT:**

U 033816

ULTNA163 Page 003 of 015

**FIRST AID-** Wash eyes immediately with large amounts of water or normal saline. occasionally lifting upper and lower lids, until no evidence of chemical remains (at least 15-20 minutes). Get medical attention immediately.

**INGESTION:**

**FIRST AID-** Treat symptomatically and supportively. Get medical attention immediately. Maintain airway, blood pressure and respiration. If vomiting occurs, keep head lower than hips to help prevent aspiration. Do not give anything by mouth or induce vomiting if person is unconscious or otherwise unable to swallow. If a poisonous substance has been ingested, it is generally suggested to proceed with the following: Induce emesis. Qualified medical personnel should consider the following: Perform gastric lavage (if there is no sign of perforation or corrosive injury). If a corrosive substance has been ingested and perforation has not occurred, it is generally suggested to proceed with the following: Rinse mouth with water. Give milk or water.

-----  
**Q SECTION 5**

**FIRE FIGHTING MEASURES**  
 -----

**FIRE AND EXPLOSION HAZARD:**

Dangerous fire hazard when exposed to heat or flame.

Vapors are heavier than air and may travel a considerable distance to a source of ignition and flash back.

Vapor-air mixtures are explosive.

**EXTINGUISHING MEDIA:**

Dry chemical, carbon dioxide, water spray or regular foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

For larger fires, use water spray, fog or regular foam (1993 Emergency Response Guidebook, RSPA P 5800.6).

**FIREFIGHTING:**

Move container from fire area if you can do it without risk. Apply cooling water to sides of containers that are exposed to flames until well after fire is out. Stay away from ends of tanks. For massive fire in cargo area, use unmanned hose holder or monitor nozzles; if this is impossible, withdraw from area and let fire burn. Withdraw immediately in case of rising sound from venting safety device or any discoloration of tank due to fire. Isolate for 1/2 mile in all directions if tank, rail car or tank truck is involved in fire (1993 Emergency Response Guidebook, RSPA P 5800.6, Guide Page 27).

Extinguish only if flow can be stopped; use water in flooding amounts as fog, solid streams may spread fire. Cool containers with flooding amounts of water. apply from as far a distance as possible. Avoid breathing vapors, keep upwind. Evacuate to a radius of 1500 feet for uncontrollable fires. Consider evacuation of downwind area if material is leaking.

Water may be ineffective (NFPA 325M, Fire Hazard Properties of Flammable Liquids, Gases, and Volatile Solids, 1991)

U 033817

ULTNA163.

Page 004 of 015

FLASH POINT: -45 F (-43 C) (CC)  
LOWER FLAMMABLE LIMIT: 1.2%  
UPPER FLAMMABLE LIMIT: 7.6%  
AUTOIGNITION: 536-853 F (286-456 C)  
FLAMMABILITY CLASS (OSHA): IB

**HAZARDOUS COMBUSTION PRODUCTS:**

Thermal decomposition products may include toxic oxides of carbon.

**SECTION 6****ACCIDENTAL RELEASE MEASURES****OCCUPATIONAL SPILL:**

Shut off ignition sources. Stop leak if you can do it without risk. Use water spray to reduce vapors. For small spills, take up with sand or other absorbent material and place into containers for later disposal. For larger spills, dike far ahead of spill for later disposal. No smoking, flames or flares in hazard area. Keep unnecessary people away; isolate hazard area and restrict entry.

**Reportable Quantity (RQ):**

The Superfund Amendments and Reauthorization Act (SARA) Section 304 requires that a release equal to or greater than the reportable quantity established for that substance be immediately reported to the local emergency planning committee and the state emergency response commission (40 CFR 355.40). If the release of this substance is reportable under CERCLA Section 103, the National Response Center must be notified immediately at (800) 424-8802 or (202) 426-2675 in the metropolitan Washington, D.C. area (40 CFR 302.6).

**WATER SPILL:**

The California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) prohibits contaminating any known source of drinking water with substances known to cause cancer and/or reproductive toxicity.

**SECTION 7****HANDLING AND STORAGE**

Observe all federal, state and local regulations when storing this substance.

Store in accordance with 29 CFR 1910.106.

Bonding and grounding: Substances with low electroconductivity, which may be ignited by electrostatic sparks, should be stored in containers which meet the bonding and grounding guidelines specified in NFPA 77-1983, Recommended Practice on Static Electricity.

Store away from incompatible substances.

**SECTION 8****EXPOSURE CONTROLS/PERSONAL PROTECTION****EXPOSURE LIMITS:****GASOLINE (BULK HANDLING):**

300 ppm (900 mg/m<sup>3</sup>) OSHA TWA; 500 ppm (1,500 mg/m<sup>3</sup>) OSHA STEL  
100 ppm (900 mg/m<sup>3</sup>) ACGIH TWA; 500 ppm (1,500 mg/m<sup>3</sup>) ACGIH STEL

**BENZENE:**

U 033818

ULTNA163

Page 005 of 015

1 ppm OSHA TWA; 5 ppm OSHA 15 minute STEL; 0.5 ppm OSHA action level

10 ppm (30 mg/m<sup>3</sup>) ACGIH TWA;

ACGIH A2-Suspected Human Carcinogen

(Notice of Intended Changes 1990-91)

0.1 ppm (0.32 mg/m<sup>3</sup>) NIOSH recommended 8 hour TWA;

1 ppm (3.2 mg/m<sup>3</sup>) NIOSH recommended 15 minute ceiling

Measurement method: Charcoal tube; carbon disulfide; gas chromatography with flame ionization detection; (NIOSH Vol. III # 1500, Hydrocarbons).

10 pounds CERCLA Section 103 Reportable Quantity

Subject to SARA Section 313 Annual Toxic Chemical Release Reporting

Subject to California Proposition 65 cancer and/or reproductive toxicity warning and release requirements- (February 27, 1987)

\*\*OSHA revoked the final rule limits of January 19, 1989 in response to the 11th Circuit Court of Appeals decision (AFL-CIO v. OSHA) effective June 30, 1993. See 29 CFR 1910.1000 (58 FR 35338)\*\*

METHYL TERT-BUTYL ETHER:

40 ppm (140 mg/m<sup>3</sup>) ACGIH TWA (proposed addition 1993-94)

Subject to SARA Section 313 Annual Toxic Chemical Release Reporting

**VENTILATION:**

Provide local exhaust or general dilution ventilation to meet published exposure limits. Ventilation equipment should be explosion-proof if explosive concentrations of dust, vapor or fume are present.

**EYE PROTECTION:**

Employee must wear splash-proof or dust-resistant safety goggles to prevent eye contact with this substance.

Emergency eye wash: Where there is any possibility that an employee's eyes may be exposed to this substance, the employer should provide an eye wash fountain within the immediate work area for emergency use.

**CLOTHING:**

Employee must wear appropriate protective (impervious) clothing and equipment to prevent repeated or prolonged skin contact with this substance.

Any clothing wet with a flammable liquid should be immediately removed at the location where it is wetted to prevent burns from possible ignition.

**GLOVES:**

Employee must wear appropriate protective gloves to prevent contact with this substance.

**RESPIRATOR:**

The following respirators are recommended based on information found in the physical data, toxicity and health effects sections. They are ranked in order from minimum to maximum respiratory protection.

The specific respirator selected must be based on contamination levels found in the work place, must be based on the specific operation, must not exceed the working limits of the respirator and must be jointly approved by the National Institute for Occupational Safety and Health and the Mine Safety

U033819

and Health Administration (NIOSH-MSHA).

ULTNA163

Page 006 of 015

Any chemical cartridge respirator with organic vapor cartridge(s) and a full facepiece.

Any gas mask with organic vapor canister (chin-style or front- or back-mounted canister), with a full facepiece.

Any type 'C' supplied-air respirator with a full facepiece operated in pressure-demand or other positive pressure mode or with a full facepiece, helmet or hood operated in a continuous-flow mode.

Any self-contained breathing apparatus with a full facepiece operated in pressure-demand or other positive pressure mode.

**FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:**

Any self-contained breathing apparatus that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode.

Any supplied-air respirator that has a full facepiece and is operated in a pressure-demand or other positive-pressure mode in combination with an auxiliary self-contained breathing apparatus operated in pressure-demand or other positive-pressure mode.

**SECTION 9**

**PHYSICAL AND CHEMICAL PROPERTIES**

**DESCRIPTION:** Clear, colorless to amber, aromatic, volatile liquid.

**BOILING POINT:** 100-400 F (38-204 C)

**VAPOR PRESSURE:** not available

**VAPOR DENSITY:** 3.0-4.0

**SPECIFIC GRAVITY:** 0.7-0.8

**WATER SOLUBILITY:** insoluble

**ODOR THRESHOLD:** 0.25 ppm

**SOLVENT SOLUBILITY:** Absolute alcohol, ether, chloroform, benzene

**SECTION 10**

**STABILITY AND REACTIVITY**

**REACTIVITY:**

Stable under normal temperatures and pressures.

**CONDITIONS TO AVOID:**

Avoid contact with heat, sparks, flames, or other sources of ignition. Vapors may be explosive. Avoid overheating of containers; containers may violently rupture in heat of fire. Avoid contamination of water sources.

**INCOMPATIBILITIES:**

**GASOLINE, AUTOMOTIVE, UNLEADED:**

**OXIDIZERS (STRONG):** Fire and explosion hazard.

**METHYL TERT-BUTYL ETHER:**

**ACIDS (STRONG):** Incompatible.

**BASES (STRONG):** Incompatible.

U 033820



ULTNA163

Page 007 of 015

**OXIDIZERS (STRONG):** Fire and explosion hazard.  
See also ethers.

**ETHERS:**

**BORON TRIIODIDE:** Vigorous reaction.

**BENZENE:**

**ACIDS (STRONG):** Incompatible.

**ALLYL CHLORIDE WITH DICHLOROETHYL ALUMINUM OR ETHYLALUMINUM SESQUICHLORIDE:**  
Possible explosion.

**ARSENIC PENTAFLUORIDE + POTASSIUM METHOXIDE:** Explosive interaction.

**BASES (STRONG):** Incompatible.

**BROMINE + IRON:** Incompatible.

**BROMINE PENTAFLUORIDE:** Fire and explosion hazard.

**BROMINE TRIFLUORIDE:** Possible explosion or ignition.

**CHLORINE:** Explosion in the presence of light.

**CHLORINE TRIFLUORIDE:** Violent reaction with possible explosion.

**CHROMIC ANHYDRIDE (POWDERED):** Ignition.

**DIBORANE:** Spontaneously explosive reaction in air.

**DIOXYGEN DIFLUORIDE:** Ignition; even at reduced temperatures.

**DIOXYGENYL TETRAFLUOROBORATE:** Ignition reaction.

**INTERHALOGEN COMPOUNDS:** Ignition or explosion.

**IODINE HEPTAFLUORIDE:** Ignition on contact.

**IODINE PENTAFLUORIDE:** Violent interaction above 50 C.

**NITRIC ACID:** Violent or explosive unless properly agitated and cooled.

**NITRIL PERCHLORATE:** Explosive interaction.

**OXIDIZERS (STRONG):** Fire and explosion hazard.

**OXYGEN (LIQUID):** Explosive mixture.

**OZONE:** Formation of explosive gelatinous ozonide.

**PERCHLORATES (METAL):** Formation of explosive complex.

**PERCHLORYL FLUORIDE + ALUMINUM CHLORIDE:** Formation of shock sensitive compound.

**PERMANGANATES + SULFURIC ACID:** Possible explosion.

**PERMANGANIC ACID:** Explosion hazard.

**PEROXODISULFURIC ACID:** Explosion hazard.

**PEROXOMONOSULFURIC ACID:** Explosive interaction.

**POTASSIUM PEROXIDE:** Ignition.

**SILVER PERCHLORATE:** Formation of explosive complex.

**SODIUM PEROXIDE + WATER:** Ignition.

**URANIUM HEXAFLUORIDE:** Violent reaction.

**HAZARDOUS DECOMPOSITION:**

Thermal decomposition products may include toxic oxides of carbon.

**POLYMERIZATION:**

Hazardous polymerization has not been reported to occur under normal temperatures and pressures.

-----  
**SECTION 11****TOXICOLOGY INFORMATION**  
-----**GASOLINE; AUTOMOTIVE, UNLEADED:**

(Data derived from unspecified and unleaded gasoline)

**IRRITATION DATA:** 500 mg/24 hours skin-rabbit mild; 500 ppm/1 hour eye-man moderate; 140 ppm/8 hours eye-human mild.

**TOXICITY DATA:** 900 ppm/1 hour inhalation-man TCLO; 300 gm/m3/5 minutes

U 033821

ULTNA163

Page 008 of 015

inhalation-rat LC50; 300 gm/m<sup>3</sup>/5 minutes inhalation-mouse LC50; 300 gm/m<sup>3</sup>/5 minutes inhalation-guinea pig LC50; 30000 ppm/5 minutes inhalation-mammal LCLo; 18,000 mg/kg oral-rat LD50; 13.6 gm/kg oral-rat LD50 (AETODY); 53 mg/kg parenteral-man TDLo; tumorigenic data (RTECS).  
**CARCINOGEN STATUS:** Human Inadequate Evidence, Animal Limited Evidence (IARC Group-2B). In studies with mice and rats by inhalation, an increased incidence of hepatocellular adenomas and carcinomas was produced in female but not male mice; an increased incidence of adenomas and carcinomas of the kidney was produced in male but not female rats.  
**LOCAL EFFECTS:** Irritant- inhalation, skin, eye.  
**ACUTE TOXICITY LEVEL:** Relatively non-toxic by inhalation and ingestion.  
**TARGET EFFECTS:** Central nervous system depressant; simple asphyxiant.  
**ADDITIONAL DATA:** The use of alcoholic beverages enhances the toxic effects. Stimulants such as epinephrine may induce ventricular fibrillation.

**BENZENE:**

**IRRITATION DATA:** 20 mg/24 hours skin-rabbit moderate; 15 mg/24 hours open skin-rabbit mild; 88 mg eye-rabbit moderate; 2 mg/24 hours eye-rabbit severe.

**TOXICITY DATA:** 2000 ppm/5 minutes inhalation-human LCLo; 2 pph/5 minutes inhalation-human LCLo; 65 mg/m<sup>3</sup>/5 years inhalation-human LCLo; 100 ppm inhalation-human TCLo; 150 ppm/1 year intermittent inhalation-man TCLo; 10000 ppm/7 hours inhalation-rat LC50; 300 ppm/6 hours/13 weeks intermittent inhalation-rat TCLo; 300 ppm/6 hours/99 weeks intermittent inhalation-rat TCLo; 9980 ppm inhalation-mouse LC50; 103 ppm/6 hours/5 days intermittent inhalation-mouse TCLo; 221 ppm/6 hours/7 days intermittent inhalation-mouse TCLo; 48 ppm/6 hours/14 days intermittent inhalation-mouse TCLo; 10 ppm/6 hours/10 weeks intermittent inhalation-mouse TCLo; 300 ppm/6 hours/13 weeks intermittent inhalation-mouse TCLo; 300 ppm/6 hours/16 weeks intermittent inhalation-mouse TCLo; 302 ppm/6 hours/26 weeks intermittent inhalation-mouse TCLo; 100 ppm/6 hours/72 weeks intermittent inhalation-mouse TCLo; 146000 mg/m<sup>3</sup> inhalation-dog LCLo; 170000 mg/m<sup>3</sup> inhalation-cat LCLo; 45000 ppm/30 minutes inhalation-rabbit LCLo; 20000 ppm/5 minutes inhalation-mammal LCLo; >9400 mg/kg skin-rabbit LD50; >9400 mg/kg skin-guinea pig LD50; 50 mg/kg oral-man LDLo; 930 mg/kg oral-rat LD50; 6600 mg/kg/27 weeks intermittent oral-rat TDLo; 4700 mg/kg oral-mouse LD50; 2 gm/kg oral-dog LDLo; 88 mg/kg intravenous-rabbit LDLo; 1400 mg/kg subcutaneous-frog LDLo; 2890 ug/kg intraperitoneal-rat LD50; 340 mg/kg intraperitoneal-mouse LD50; 527 mg/kg intraperitoneal-guinea pig LDLo; 1500 mg/kg intraperitoneal-mammal LDLo; 194 mg/kg unreported-man LDLo; mutagenic data (RTECS); reproductive effects data (RTECS); tumorigenic data (RTECS).

**CARCINOGEN STATUS:** OSHA Carcinogen; Known Human Carcinogen (NTP); Human Sufficient Evidence, Animal Sufficient Evidence (IARC Group-1). Numerous case reports and series have suggested a relationship between exposure to benzene and the occurrence of various types of leukemia. Several case-control studies have also shown increased odds ratios for exposure to benzene, but mixed exposure patterns and poorly defined exposures render their interpretation difficult. Three independent cohort studies have demonstrated an increased incidence of acute nonlymphocytic leukemia in workers exposed to benzene.

**LOCAL EFFECTS:** Irritant- inhalation, skin, eye.

**ACUTE TOXICITY LEVEL:** Moderately toxic by inhalation and ingestion; slightly toxic by dermal absorption.

**TARGET EFFECTS:** Central nervous system depressant; bone marrow depressant. Poisoning may also affect the immune system and the heart.

**AT INCREASED RISK FROM EXPOSURE:** Persons with certain immunological

U 033022

ULTNA163 Page 009 of 015

tendencies, poor nutrition, anemia and drug or chemically induced agranulocytosis.

**ADDITIONAL DATA:** Use of alcoholic beverages may enhance the toxic effects. Use of stimulants such as epinephrine may cause cardiac arrhythmias. May cross the placenta. Interactions with medications have been reported.

**METHYL TERT-BUTYL ETHER:**

**TOXICITY DATA:** 85 mg/L inhalation-rat LC50 (38MKAJ); 23,576 ppm/4h inhalation-rat LC50; 141 mg/m<sup>3</sup>/15 minutes inhalation-mouse LC50; >7405 mg/kg skin-rabbit LD50 (38MKAJ); 2962 mg/kg oral-rat LD50 (38MKAJ); 4 gm/kg oral-rat LD50.

**CARCINOGEN STATUS:** None.

**ACUTE TOXICITY LEVEL:** Moderately toxic by ingestion and inhalation; slightly toxic by dermal absorption.

**TARGET EFFECTS:** Central nervous system depressant.

**AT INCREASED RISK FROM EXPOSURE:** Persons with pre-existing skin disorders, eye problems or impaired respiratory function.

**HEALTH EFFECTS**

**INHALATION:**

**GASOLINE, AUTOMOTIVE, UNLEADED:**

**IRRITANT/NARCOTIC/ASPHYXIAN/CARCINOGEN.**

**ACUTE EXPOSURE-** At 160-270 ppm throat irritation may occur within several hours. At 2000 ppm mild anesthesia may occur within 30 minutes. Other symptoms of central nervous system depression may include headache, nausea, vomiting, dizziness, drowsiness, facial flushing, blurred vision, slurred speech, difficulty swallowing, staggering, confusion and euphoria. At higher levels dyspnea, pulmonary edema and bronchopneumonia may develop. Further depression may occur with weak respiration and pulse, nervousness, twitching, irritability, and ataxia. Severe intoxication may result in delirium, unconsciousness, coma, and convulsions with epileptiform seizures. The pupils may be constricted or, in comatose states, fixed and dilated or unequal; nystagmus may also occur. May also affect the liver, kidneys, spleen, brain, myocardium and pancreas. Death may be due to respiratory or circulatory failure or ventricular fibrillation. Extremely high concentration may cause asphyxiation.

**CHRONIC EXPOSURE-** With few exceptions, most of the reported effects of repeated inhalation are from intentional "sniffing" of gasoline rather than workplace exposure. Reported symptoms include headache, nausea, fatigue, anorexia and weight loss, pallor, dizziness, insomnia, memory loss, nervousness, confusion, muscular weakness and cramps, peripheral neuropathy, polyneuritis, and neurasthenia. It is unclear whether some of these symptoms may have been due to gasoline containing lead. Liver and kidney damage are also possible. In a 90 day study, male but not female rats exhibited a severe, dose-related renal toxicity. In another study, an increase in renal adenomas and carcinomas in male rats and an increase in hepatocellular adenomas and carcinomas in female mice were reported.

**BENZENE:**

**IRRITANT/NARCOTIC/BONE MARROW DEPRESSANT/CARCINOGEN.**

**ACUTE EXPOSURE-** Concentrations of 3000 ppm may cause respiratory tract irritation; more severe exposures may result in pulmonary edema. Systemic effects are mainly on the central nervous system and depend on exposure time and concentration. No effects were noted at 25 ppm for 8 hours; signs of intoxication began at 50-150 ppm within 5 hours; at 500-1500 ppm.

U 033823



ULTNA163

Page 010 of 015

within 1 hour; were severe at 7500 ppm, within 30-60 minutes; and 20,000 ppm was fatal within 5-10 minutes. Effects may include nausea, vomiting, headache, dizziness, drowsiness, weakness, sometimes preceded by a brief period of exhilaration or euphoria, irritability, malaise, confusion, ataxia, staggering, weak, rapid pulse, chest pain and tightness with breathlessness, pallor, cyanosis of the lips and fingertips, and tinnitus. In severe exposures there may be blurred vision, shallow, rapid breathing, delirium, cardiac arrhythmias, unconsciousness, deep anesthesia, paralysis, and coma characterized by motor restlessness, tremors and hyperreflexia, sometimes preceded by convulsions. Recovery depends on the severity of exposure. Polyneuritis may occur and there may be persistent nausea, anorexia, muscular weakness, headache, drowsiness, insomnia, and agitation. Nervous irritability, breathlessness, and unsteady gait may persist for 2-3 weeks; a peculiar skin color and cardiac distress may persist for 4 weeks. Liver and kidney effects may occur, but are usually mild, temporary impairments. Chromosomal damage has been found after exposure to toxic levels. Although generally hematotoxicity is not a significant concern in acute exposure, delayed hematological effects, including anemia and thrombocytopenia, have been reported, as have petechial hemorrhages, spontaneous internal bleeding and secondary infections. In fatal exposures, death may be due to asphyxia, central nervous system depression, cardiac or respiratory failure and circulatory collapse, or occasionally, sudden ventricular fibrillation. It may occur within a few minutes to several hours, or cardiac arrhythmia may occur at anytime within 24 hours. Also, death from central nervous system, respiratory or hemorrhagic complications may occur up to 5 days after exposure. Pathologic findings have included respiratory inflammation with edema and hemorrhage of the lungs, renal congestion, cerebral edema, and extensive petechial hemorrhages in the brain, pleurae, pericardium, urinary tract, mucous membranes, and skin.

**CHRONIC EXPOSURE-** Longterm exposure may cause symptoms referable to the central nervous, hematopoietic and immune systems. Early effects are vague and varied and may include headache, light-headedness, dizziness, nausea, anorexia, abdominal discomfort, and fatigue. Sore, dry throat, weakness, lethargy, malaise, drowsiness, nervousness, and irritability have also been reported. Later there may be dyspnea, pallor, slightly increased temperature, decreased blood pressure, rapid pulse, palpitations, and visual disturbances. Dizziness when cold water is placed in the ear and hearing impairment have been reported, as have diffuse cerebral atrophy associated with ataxia, tremors and emotional lability. Workers exposed to benzene in combination with other solvents have exhibited polyneuritis. Several case reports, one of them an acute exposure, suggest the possibility that systemic exposure may be associated with retrobulbar or optic neuritis. Occasionally hemorrhages in retina and conjunctiva occur and rarely neuroretinal edema and papilledema have accompanied the retinal hemorrhages. Hematological effects vary widely and may appear after a few weeks or many years of exposure or even many years after exposure has ceased. The degree of exposure below which no blood effects will occur cannot be established with certainty. In the early stages, there may be blood clotting defects due to morphological, functional and quantitative platelet alteration with resultant bleeding from the nose and gums, easy bruising and petechiae; leukopenia with predominant lymphocytopenia or neutropenia; and anemia which may be normochronic or macrocytic and hypochronic. Extramedullary hematopoiesis, splenomegaly, circulating immature marrow cells, and an initial increase in leukocytes, erythrocytes and platelets have also been reported.

U 033824

ULTNA163 Page 011 of 015

The bone marrow may be hyper-, hypo- or normoplastic and does not always correlate with the peripheral blood picture. Also, the symptoms do not always parallel the laboratory findings. If treated at this stage, the effects appear reversible, although recovery may be protracted and there may be relapses. Decreased erythrocyte survival, hemolysis, capillary fragility, internal hemorrhages, iron metabolism disturbances, and hyperbilirubinemia have also been reported. Exposure to high levels for longer periods may result in aplasia and fatty degeneration of the bone marrow with pancytopenia. The most serious cases of aplastic anemia may be fatal due to hemorrhage and infection; death may occur within 3 months of diagnosis. Enormous variability in individual response, including non-dose dependent aplasia, and the finding of eosinophilia suggests that, in some cases, the blood dyscrasia may partially be an allergic reaction. Numerous case reports and series have suggested a relationship between exposure to benzene and the occurrence of various types of leukemia. Several case-control studies have also shown increased odds ratios for exposure to benzene, but mixed exposure patterns and poorly defined exposures render their interpretation difficult. Three independent cohort studies have demonstrated an increased incidence of acute nonlymphocytic leukemia in workers exposed to benzene. Several studies have also suggested a link between occupational exposure and multiple myeloma and lymphoma, both Hodgkin's and nonHodgkin's. Although aplastic anemia is probably the more likely consequence of longterm exposure, it is not uncommon for an individual surviving this, to go through a preleukemic phase into frank leukemia. Conversely, leukemia without precedent aplastic anemia can occur. In one study the range of time from the start of the exposure to the diagnosis of leukemia was 3-24 years. It has been suggested that the chromosomal aberrations which can arise in peripheral blood and bone marrow cells and persist for a long time after exposure ceases, may be associated with the increased incidence of leukemia. The immunosuppressive effect has also been suggested as being associated with the leukemogenesis. Adverse effects on the immunological system have been shown to make rabbits more susceptible to tuberculosis and pneumonia and may explain why the terminal event in some cases of benzene intoxication may be overwhelming infection. Exposed mice exhibited a tendency toward induction of lymphoid neoplasms. Rats exhibited an increased incidence of neoplasms, mainly carcinomas, at various sites. Menstrual disturbances have been reported more frequently in exposed women. Testicular damage has been reported in rats, rabbits and guinea pigs. Some animal studies have demonstrated embryo/fetotoxicity, sometimes at levels as low as 10 ppm and the potential for teratogenic effects such as decreased body weight and skeletal variants, have also been shown. Other studies have not produced any abnormalities or embryoletality.

**METHYL TERT-BUTYL ETHER:  
NARCOTIC.**

**ACUTE EXPOSURE-** May cause irritation to the mucous membranes. Headaches, dizziness, sleepiness, anesthetic effects, weakness of distal muscles, and central nervous system depression may result from over-exposure.

**CHRONIC EXPOSURE-** Subacute exposure to 1000 and 3000 ppm caused reduced reaction to auditory stimuli, histologic inflammation of the nasal mucosa and trachea, and increased liver weights in rats. Symptoms of acute exposure may be produced by repeated or prolonged inhalation.

U 033825

ULTNA163

Page 012 of 015

**SKIN CONTACT:****GASOLINE, AUTOMOTIVE, UNLEADED:  
IRRITANT.****ACUTE EXPOSURE-** Liquid may cause irritation with erythema and pain.

Prolonged or extensive contact may cause blistering and, in extreme cases epidermal necrolysis. A 12 year old boy partially immersed in a pool of gasoline for 1 hour experienced hypotension, abdominal tenderness, disseminated intravascular coagulation, transient hematuria, nonoliguric renal failure and an elevated serum amylase. Autopsy revealed cerebral edema, diffuse bilateral pneumonia, biventricular cardiac enlargement, toxic nephrosis, fatty infiltration of liver and peripancreatic fat necrosis.

~~CHRONIC EXPOSURE-~~ Repeated or prolonged contact with the liquid may cause irritation, dermatitis and defatting of the skin with drying and cracking or burns and blistering. Some individuals may develop hypersensitivity, probably due to additives.

**BENZENE:****IRRITANT.**

**ACUTE EXPOSURE-** Direct contact may cause irritation. Effects may include erythema, a burning sensation, and with prolonged contact, blistering and edema. Under normal conditions, significant signs of systemic toxicity are unlikely from skin contact alone due to the slow rate of absorption; it may however, contribute to the toxicity from inhalation. Application to guinea pigs resulted in increased dermal permeability.

**CHRONIC EXPOSURE-** Repeated or prolonged contact defats the skin and may result in dermatitis with erythema, scaling, dryness, vesiculation, and fissuring, possibly accompanied by paresthesias of the fingers which may persist several weeks after the dermatitis subsides. Peripheral neuritis has also been reported. Secondary infections may occur. Tests on guinea pigs indicate sensitization is possible. Although animal studies have failed to establish a relationship between skin contact and a carcinogenic effect, most of the studies were inadequate; some papillomas and hematopoietic effects have been reported.

**METHYL TERT-BUTYL ETHER:**

**ACUTE EXPOSURE-** May cause slight irritation. May be absorbed through the skin.

**CHRONIC EXPOSURE-** Repeated and prolonged contact may cause dermatitis due to the defatting action.

**EYE CONTACT:****GASOLINE, AUTOMOTIVE, UNLEADED:  
IRRITANT.**

**ACUTE EXPOSURE-** Concentrations between 270 and 900 ppm may cause a sensation of irritation often before signs such as conjunctival hyperemia are visible. Liquid splashed in the eyes may cause pain, smarting and slight, transient corneal epithelial disturbance. Blepharospasm and conjunctival hyperemia and edema may occur.

**CHRONIC EXPOSURE-** Repeated or prolonged exposure may cause conjunctivitis and possible gradual, irreversible loss of corneal and conjunctival sensitivity.

U 033826

ULTNA163

Page 013 of 015

**BENZENE:  
IRRITANT.**

**ACUTE EXPOSURE-** May cause irritation. Vapor concentrations of 3000 ppm are very irritating, even on brief exposure. Droplets cause a moderate burning sensation, but only a slight, transient corneal epithelial injury with rapid recovery.

**CHRONIC EXPOSURE-** Repeated or prolonged exposure may cause conjunctivitis. 50% of rats exposed to 50 ppm for more than 600 hours developed cataracts.

**METHYL TERT-BUTYL ETHER:**

**ACUTE EXPOSURE-** Liquid and vapor may cause mild to moderate irritation and tissue damage.

**CHRONIC EXPOSURE-** Prolonged or repeated contact may cause effects detailed in acute exposure.

**INGESTION:****GASOLINE, AUTOMOTIVE, UNLEADED:****NARCOTIC.**

**ACUTE EXPOSURE-** May cause irritation and burning of the gastrointestinal tract with nausea, vomiting and diarrhea. Absorption may cause initial central nervous stimulation followed by depression. Symptoms may include a mild excitation, restlessness, nervousness, irritability, twitching, weakness, blurred vision, headache, dizziness, drowsiness, incoordination, confusion, delirium, unconsciousness, convulsions and coma. Cardiac arrhythmias may occur. Transient liver damage is possible. Direct or indirect aspiration may cause chemical pneumonitis with pulmonary edema and hemorrhage, possibly complicated by bacterial pneumonia, and less frequently, by emphysema and pneumothorax. Signs of pulmonary involvement may include coughing, dyspnea, substernal pain, sudden development of rapid breathing, cyanosis, tachycardia and fever. Even small amounts may be fatal with death caused by cardiac arrest, asphyxia or respiratory paralysis. Depending on amount aspirated, death may occur rapidly or within 24 hours.

**CHRONIC EXPOSURE-** No data available.

**BENZENE:****NARCOTIC/CARCINOGEN.**

**ACUTE EXPOSURE-** May cause local irritation and burning sensation in the mouth, throat and stomach, and hemorrhagic inflammatory lesions of the mucous membranes in contact with the liquid. Signs and symptoms of systemic intoxication may include nausea, vomiting, headache, dizziness, weakness, staggering, chest pain and tightness, shallow, rapid pulse and respiration, breathlessness, pallor followed by flushing, and a fear of impending death. There may be visual disturbances, tremors, convulsions, ventricular irregularities, and paralysis. Excitement, euphoria or delirium may precede weariness, fatigue, sleepiness and followed by stupor and unconsciousness, coma and death from respiratory failure. Those who survive the central nervous system effects may develop bronchitis, pneumonia, pulmonary edema, and intrapulmonary hemorrhage. Aspiration may cause immediate pulmonary edema and hemorrhage. The usual lethal dose in humans is 10-15 milliliters, but smaller amounts have been reported to cause death. A single exposure may produce longterm effects with pancytopenia persisting up to a year.

**CHRONIC EXPOSURE-** Daily administration to humans of 2-5 grams in olive oil caused headache, vertigo, bladder irritability, impotence, gastric disturbances, and evidence of renal congestion. In female rats treated

U 033527



ULTNA163 Page 014 of 015

with 132 single daily doses over 187 days, no effects were observed at 1 mg/kg; slight leukopenia at 10 mg/kg; and both leukopenia and anemia at 50 and 100 mg/kg. Oral administration to rats and mice at various dose levels induced neoplasms at multiple sites in males and females. In a one year gavage study, rats given 50 or 250 mg/kg, 4-5 days/week for 52 weeks did not exhibit acute or subacute toxic effects, but a dose correlated increase of leukemias and mammary carcinomas was observed; some other tumor types were also reported. Reproductive effects have been reported in animals.

**METHYL TERT-BUTYL ETHER:  
NARCOTIC.**

**ACUTE EXPOSURE-** May cause gastrointestinal tract irritation and discomfort. If sufficient amounts are ingested, central nervous system depression may occur. Laryngeal, ocular, and respiratory muscles may be affected in severe poisoning.

**CHRONIC EXPOSURE-** Symptoms of acute exposure may be produced by chronic ingestion.

-----  
**2 SECTION 12 ECOLOGICAL INFORMATION** 2  
-----

**ENVIRONMENTAL IMPACT RATING (0-4):** no data available

**ACUTE AQUATIC TOXICITY:** no data available

**DEGRADABILITY:** no data available

**LOG BIOCONCENTRATION FACTOR (BCF):** no data available

**LOG OCTANOL/WATER PARTITION COEFFICIENT:** no data available

-----  
**2 SECTION 13 DISPOSAL INFORMATION** 2  
-----

Observe all federal, state and local regulations when disposing of this substance.

Disposal must be in accordance with standards applicable to generators of hazardous waste, 40 CFR 262. EPA Hazardous Waste Number D001.

100 pound CERCLA Section 103 Reportable Quantity.

Benzene - Regulatory level: 0.5 mg/l (TCLP-40 CFR 261 Appendix II) materials which contain the above substance at or above the TCLP regulatory level meet the EPA toxicity characteristic, and must be disposed of in accordance with 40 CFR part 262. EPA Hazardous Waste Number D018.

-----  
**2 SECTION 14 TRANSPORTATION INFORMATION** 2  
-----

**U.S. DEPARTMENT OF TRANSPORTATION SHIPPING NAME-ID NUMBER, 49 CFR 172.101:**  
Gasoline-UN 1203

**U.S. DEPARTMENT OF TRANSPORTATION HAZARD CLASS OR DIVISION, 49 CFR 172.101:**  
3 - Flammable liquid

U 033828

ULTNA163

Page 015 of 015

U.S. DEPARTMENT OF TRANSPORTATION PACKING GROUP, 49 CFR 172.101:  
PG II

U.S. DEPARTMENT OF TRANSPORTATION LABELING REQUIREMENTS, 49 CFR 172.101  
AND SUBPART E:  
Flammable liquid

U.S. DEPARTMENT OF TRANSPORTATION PACKAGING AUTHORIZATIONS:  
EXCEPTIONS: 49 CFR 173.150  
NON-BULK PACKAGING: 49 CFR 173.202  
BULK PACKAGING: 49 CFR 173.242

-----  
D SECTION 15

REGULATORY INFORMATION

-----  
TSCA STATUS: Y

CERCLA SECTION 103 (40CFR302.4): Y

BENZENE:

10 pounds RQ

SARA SECTION 302 (40CFR355.30): N

SARA SECTION 304 (40CFR355.40): N

SARA SECTION 313 (40CFR370.65): Y

OSHA PROCESS SAFETY (29CFR1910.119): N

CALIFORNIA PROPOSITION 65: Y

SARA HAZARD CATEGORIES, SARA SECTIONS 311/312 (40 CFR 370.21)

ACUTE HAZARD: Y

CHRONIC HAZARD: Y

FIRE HAZARD: Y

REACTIVITY HAZARD: N

SUDDEN RELEASE HAZARD: N

-----  
D SECTION 16

OTHER

-----  
COPYRIGHT 1994 OCCUPATIONAL HEALTH SERVICES, INC. ALL RIGHTS RESERVED.

U 033020

# **EXHIBIT 5**

## MEMORANDUM

San Francisco, CA  
August 12, 1991

TIP Letter # 237  
MTBE Effects

## REGIONAL MANAGERS:

As you all know Methyl-tertiary-butyl-ether (MTBE) is widely used in gasoline throughout our distribution network. The oxygenated fuel requirements in the recent reauthorization of the federal Clean Air Act will only increase the use of MTBE and its concentration in our gasolines. In light of this, we thought it prudent to pass on some facts concerning the potential effects, both environmental and budgetary, of a spill or leak of gasoline containing MTBE into the groundwater. This information may help you to prioritize sites due for UST upgrades (ie. spill containment, release detection, etc.).

Typically, benzene is the component that determines the extent of a dissolved hydrocarbon plume and is the component with the most stringent cleanup standards. While benzene concentrations in the groundwater are the driving force for most cleanups, benzene is relatively easy to remove by carbon adsorption or air stripping and it will naturally biodegrade in most subsurface environments.

MTBE on the other hand is a different situation. The solubility of benzene in water is 1,800 parts per million (ppm), while the solubility of MTBE in water is 43,000 ppm! The dissolved plume that results from a leak into groundwater is directly related to the solubility in water of the chemical. The higher the solubility the larger the plume and the faster it will migrate.

When MTBE gets into the water then the trouble really starts. Removal of a compound by air stripping is governed by the Henry's Law constant; the constant for MTBE is 1/7 that of benzene; the biodegradation of MTBE is 1/5 that of benzene; the carbon adsorption of MTBE is 1/5 that of benzene. MTBE has two additional characteristics that only exacerbate the problem. Dissolved benzene transport in water is retarded due to adsorption; MTBE transport is not significantly slowed since it does not adsorb to soil as well. Water containing over 1,500 ppm of MTBE is flammable and can lead to explosive vapors. Attached you will find a summary of MTBE properties provided by R.J. Hinds of CRTC.

CONFIDENTIAL: This document is subject to the  
September 21, 1999 Stipulated Protective Order entered  
in San Francisco Superior Court, Case No. 999128.

CHEV 09564



As you can see, a groundwater cleanup where MTBE is present has the potential to be 2-3 times as expensive as our present groundwater cleanups. The resulting plume will be much larger and the removal of MTBE is very difficult at best.

Our highest degree of concern right now is with service stations without spill containment manholes that are, or will be, served by racks that are blending MTBE. The combination of MTBE gasoline being delivered, the lack of spill containment manholes, and shallow groundwater could be tremendously expensive for us in the long run. As they say, an ounce of prevention is worth a pound of cure, and in this case prevention is certainly prudent.

J.L.KOERBER

JK

DJL/

cc. A.M. Caccamo  
D.N. Perkins  
J.L. Pease  
R.J. Hinds  
Compliance Specialists  
TIP Coordinators  
Env. Engineering Supervisors  
H.W. Riggs

CONFIDENTIAL: This document is subject to the  
December 21, 1999 Stipulated Protective Order entered  
in the San Francisco Superior Court, Case No. 999128.

CHEV 09565

# **EXHIBIT 6**

MEMORANDUM

Mr. B. Baggott F 9/1021  
 Mr. L. L. Long  
 Mr. C. R. Kerr (Southwest Region, Marketing)

MDA  
 #FYI

March 26, 1991

For info of interested  
 in these documents, attach

CHEMICAL ENTRY REVIEW  
FOR MTBE

Furman Foster (Mathwest  
 Region Ops. Mgr.) requested

A. L. Perkins: From Salt Lake Refinery. L. F. Williams  
 4-12-91

I have completed the environmental group's portion of the chemical entry review for MTBE. Bill Davis has previously completed his Safety Review. I will include a copy of this memo with the chemical review materials that still must be reviewed by Earl Shirts before they are returned to Bill Davis and then to you.

We understand that you are preparing for possible entry of MTBE into the refinery (or marketing) and simply wanted to develop our concerns for using this material. Whether the facilities are installed by marketing or the refinery, our concerns listed below are the same, especially since we currently treat marketing's waste water and have some responsibilities for fighting fires at the marketing terminal.

Bill Davis and I have signed the chemical entry review sheet allowing MTBE entry into the refinery subject to the following conditions:

1. Meet Bill Davis' safety concerns (attached).
2. Meet the following environmental concerns.
  - A. Spills or leaks of MTBE must be contained and prevented from contacting the ground or entering the waste water drainage system. This requirement includes above-ground impoundments at the unloading area to prevent hose disconnection spills. Sample stations also need to be engineered to prevent spills. Impoundments should be sealed like our hazardous waste pad.
  - B. Contaminated soil or water that has contacted MTBE or other oxygenates will likely be a hazardous waste because of the low flash points. Proper disposal procedures should be established and published.
  - C. Tanks containing MTBE should have double bottoms and leak detection systems.
  - D. Provide proper facilities for shutdowns and tank cleaning to prevent any MTBE from being spilled or washing into the drainage system.
  - E. Complete a HAZOP study on the planned facilities

CH 007163

during the design phase of the project. Safety and environmental concerns should be included in this study.

The attached memo from the El Segundo environmental group discusses the environmental effects of MTBE and Methanol. These chemicals are different than any other stocks that we have handled in the refinery before and consideration needs to be given towards mitigation of extreme environmental risks.

I will pass this information on to Earl Shirts for his review. Please see me if you have any questions.

Jeff Johns

Attachments

cc: RER, MGE, MDH, TJF, JNJ, SLR, MRS, WRD, MLP

CH 00716

# **EXHIBIT 7**

MSG FROM: WH889CCS--VM19 TO: MK59MDM--VM01  
To: MK59MDM --VM01

07/15/93 07:28:39

\*\*\* Reply to note of 07/14/93 19:23  
Curtis C. Stanley  
Staff Hydrogeologist - Environmental RD&T  
Subject: Bolsa Chica @ Edinger, Huntington Beach

Sounds like you guys are covering the bases as best as you can. We need to convince management to implement dual containment NOW!

Curtis C. Stanley  
Staff Hydrogeologist - Environmental RD&T  
Profs Nickname: HYDRO1 Location: WRC ET-102  
Bell: 493-7675 SSN: 433-7675

yyBolsa Chica @ Edinger, Huntington Beach  
MSG FROM: MK59MDM --VM01 TO: WH889CCS--VM19  
To: WH889CCS--VM19

07/14/93 19:23:54 R00

\*\*\* Reply to note of 07/14/93 08:32  
From: DAN MCGILL, MDML  
Subject: Bolsa Chica @ Edinger, Huntington Beach  
The tanks were single wall with single wall lines (two of the lines were also leaking under the dispensers). We need some help out here... this stuff is going to greatly increase the cost of our clean-ups. The one good note is that MTBE is acting as a tracer for leaks - this is the second time that our lab data has indicated that we are having an on going release. Our lab "screens" all of our groundwater samples for MTBE and gives me a call if MTBE shows up some where we have not seen it before.

cc: MK40PJP --VM01 P J PUGNALE

M. DANIEL MCGILL  
ENVIRONMENTAL ENGINEER  
ANAHEIM, CALIFORNIA  
SSN 520-3370

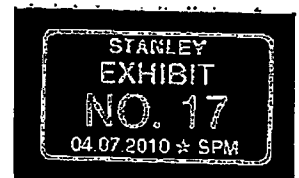
yyBolsa Chica @ Edinger, Huntington Beach  
MSG FROM: WH889CCS--VM19 TO: WH889ALO--VM19  
To: WH889ALO--VM19 A L OTERMAT

07/15/93 11:22:36 R00

Curtis C. Stanley  
Staff Hydrogeologist - Environmental RD&T  
Subject: Tech. Assurance Paragraph for Waste Site Manager's Meeting

Per Environmental RD&T's technical assurance role in Product's, a draft paper describing components for achieving technical assurance at waste sites was presented. Copies of this document will be distributed to all waste site managers for comments. A key component for technical assurance is based around waste site technical teams on higher priority sites. These teams will function in much the same way that groundwater teams work at manufacturing locations. Comments will be reviewed at the next Waste Sites Team Meeting and a final document will then be prepared.

Curtis C. Stanley  
Staff Hydrogeologist - Environmental RD&T  
Profs Nickname: HYDRO1 Location: WRC ET-102  
Bell: 493-7675 SSN: 433-7675



EQWHCS-E 0252400

# **EXHIBIT 8**

*Jim Stambolis: This is marketing's  
response to DSD. Tell decision with  
San Francisco, CA you later this week  
April 27, 1995*

*Thanks.*

*Mark*

*5/2/95*



**Chevron**

Product Engineering

CONFIDENTIAL

REC'D

MDK

JK

MTBE IN GROUND WATER ISSUE

MR. D.J. O'REILLY:

This memo is in response to a note you wrote on a recent memo sent to you (plus Mr. K.T. Derr and Mr. J.N. Sullivan) from Mr. R.L. Hartung regarding Methyl Tert Butyl Ether (MTBE) contamination of ground water. You asked Mr. B.D. Frolich and me if we were concerned and if any action was needed (memo attached for your convenience). This response was developed by Product Engineering in consultation with the Marketing Environmental, Health, and Safety team, the Alternative Fuels group, Public Affairs, and Chevron Research and Technology Company (CRTC).

Mr. Hartung's memo included a report by the United States Geological Survey (USGS) that summarized MTBE properties, sources, fate in the environment, and the discovery of MTBE in shallow ground water (mostly in urban areas). The USGS report did not include data regarding MTBE contamination in the deeper ground water used for drinking water, but stated that, "... there are few data showing concentrations of MTBE at these deeper depths." It is not clear what risk exists for MTBE transport from shallow groundwater to deeper ground water used as drinking water. The American Petroleum Institute (API) developed a response-only document in connection with the USGS report (attached). The API document quotes a regional EPA administrator as saying, "The concentrations (of MTBE) you find are substantially below anything that we would remotely consider a human health risk."

The USGS report points out that gasoline blended with MTBE may pose a greater risk to drinking water than non-oxygenated gasoline, because MTBE is soluble in water, plus it resists soil filtration and decay compared to other gasoline components. These concerns are not new, as Marketing raised the same issues ten years ago in connection with the Tank Integrity Program. Marketing does not believe that the urban shallow-ground-water MTBE contamination described in the USGS report is an urgent or significant threat to public health.

DEPTIAL: This document is subject to the September  
Updated Protective Order entered by the San  
Superior Court, Case No. 88-9128.

CHEV 05693



Mr. D.J. O'Reilly

4/27/85

Page 2

It is not yet clear what impact the MTBE-in-groundwater issue will have on the ongoing efforts of some to restrict the use of MTBE in gasoline. Although the early media interest in the USGS report has been light, connecting a potential water pollution problem to MTBE in addition to the alleged health problems may make it even more difficult for environmentalists to support MTBE.

Marketing believes that the MTBE in groundwater issue is just one more additional justification for the large Marketing capital investment in avoiding terminal and service station leaks and spills. While the USGS report will be used by anti-MTBE organizations, we do not currently expect the report to generate substantial additional interest in regulating or restricting MTBE use in gasoline in the short term.

~~In Mr. Hartung's memo, he mentions that ARCO announced that it is embarking on their own MTBE/groundwater test program, and that ARCO encouraged others to do independent testing on their own areas of concern. We do not recommend that Chevron begin a groundwater testing program for MTBE. The Alternative Fuels group and CRTC will take the lead roles monitoring the MTBE-In-groundwater issue, and inform you of significant future developments.~~

Please contact me if you have any questions.

  
D.C. SMITH

Attachments

cc: B.D. Frolich  
R.E. Zalesky  
R.M. Wilkenfeld  
L.S. Shushan

J.B. Krider  
F. Sam  
C.L. Blackwell

CONFIDENTIAL: This document is subject to the September 1994 stipulated Protective Order entered by the San Francisco Superior Court, Case No. 899125.

CHEV 05694

000

05 214 0NINIEH 575 57

05/02/95 THE 12:41 PM 415 984 3037

# **EXHIBIT 9**

Legal Retention at MSXSOC

From: Stanley CC (Curtis) at MSXWHWTC  
Sent: Thursday, May 14, 1998 10:25 AM  
To: Bell, Kathy; Boschetto, Brad; Broussard, Gweneyette; Chiang, Chen; Chou, Chi-su; Daly, Phil; Darmer, Ken; Dedoes, Robert; Deeley, George; Devauli, George; Dinkfeld, Edward; Dorn, Phil; Dove, John; Eitinger, Robert; Farrier, Daniel; Franceschini, Timothy; Gallagher, Michael; Gillmore, Kathleen; Green, Tom; Hansen, Erik; Hastings, Robert; Hong, Marjorie; Hsu, Ed; Iyle, Jerry; Jacobs, Joe; Krewinghaus, Bruce; Lewis, Richard; Lieder, Chuck; Lyons, Karen; Marshall, Glen; Miller, Jim; Miller, Jonathan; Neaville, Chris; Otermat, Art; Pugnaie, Pete; Register, Allen; Rhodes, Ileana; Salanitro, Joe; Schroder, Richard; Sepesi, John; SHELTON, CHARLES; Spinelle, John; Spinnler, Gerard; Springer, Ken; Stearns, Steve; Sun, Paul; White, Christine  
Cc: Gustafson JB at SHELL RESEARCH THORNTON; Parkinson CD (Chris) at OPC  
Subject: FW: MTBE CONTAMINATION

This article highlights the issue around leak detection and backs up our research that extremely small releases can cause groundwater problems. I think that this issue may cause us to reevaluate how we do leak detection in environmentally sensitive areas

**Curtis C. Stanley**

Environmental Technology Directorate - Soil and Groundwater

Westhollow Technology Center

(phone-@2) 281-544-7675 (fax-@) 281-544-8727

e-mail: [ccstanley@shellus.com](mailto:ccstanley@shellus.com)

(This communication per applicable agreements between our respective companies.)

-----Original Message-----

From: Judy Shaw [SMTP:shaw@api.org] <<mailto:shaw@api.org>>  
Sent: Thursday, May 14, 1998 7:55 AM  
To: Al Jessel; Brian Hamey; Carol Fairbrother; Curt Stanley; Dave Peirce; David Smith; Don Gilson; Eric Vogt; Gene Mancini; Georgia Callahan; Gerry Raabe; Gweneyette Broussard; James Rocco; Jeff Sickenger; Jim Ford; Jim Stevenson; John Taunton; Lee Hoffman; Mark Saperstein; Mary Kate Kell; Mike Wang; Ned Seppi; Ron Benton; Tim Buscheck; William Doyle  
Cc: Alexis Steen; Bill Bush; Bill Frick; Bob Greco; bruce bauman; Carol Henry; Chuck Krambuhl; David Deal; David Lax; Debi Tulou; Dee Gavora; Eldon Rucker; Howard Feldman; Jim Williams (MDM); Karen Inman; Kim Ashton; Larry Magni; Marc Meteyer; Martha Jordan; Molly Sinclair; Rick Brown; Robert Barter; Ron Chittim; Theresa Pugh; Tom Lareau; Valerie Ughetta  
Subject: FW: MTBE CONTAMINATION

FYI, more info on Maine. Judy

> From: Bruce Bauman  
> Sent: Wednesday, May 13, 1998 3:21 PM  
> To: Kim Ashton; Judy Shaw; Robert Barter; Molly Sinclair  
> Cc: Creg Smith; Larry Magni; Denise McCourt  
> Subject: RE: MTBE CONTAMINATION

>  
> Here are links to the Monday and Tuesday articles if you want any gory  
> details. Look like they will have fun with this one.  
> The Monday article notes that this is a new gas station that just  
> opened in July 1997, so this incident, if tied to this facility, will  
> likely raise questions (again) about the adequacy of fully upgraded  
> USTs and their leak detection systems to prevent releases and to  
> detect them properly. It seems this release was only detected through  
> some on-site wells drilled for a proposed property transfer. ....

> <http://www.portland.com/menews/story3.htm>

> <http://www.portland.com/tunews/story5.htm>

SH 032805

# **EXHIBIT 10**

Legal Retention at MSXSOC

From: Stanley CC (Curtis) at MSXWHWTC  
Sent: Tuesday, November 03, 1998 12:21 AM  
To: Pedley JF (Joanna) at MSXWHWTC; Benton F R [Newcos]  
Cc: Mcarragher S (Steve) at OPC  
Subject: RE: MTBE IN GROUNDWATER - ISSUES BRIEF

I am out of the office and will return on Thursday. Based on a quick review of the attached material, there are several points that need to be made.

- 1) Very small releases of MTBE (even small overfills seeping into cracks in the pavement) have the potential to adversely impact groundwater
- 2) Based on engineering reliability studies, it is likely that a high percentage of sites using MTBE, have a soil and/or groundwater problem. This problem is not just the result of leaking tanks, lines, fills, and dispensers, but is also a result of certain operations.
- 3) Due to MTBE's high solubility and low attenuation rates, it has the potential to migrate large distances relative to benzene (see attached paper)
- 4) Those sites which are located over potable groundwater are potentially very high risk sites.
- 5) Odor and taste will drive the cleanup goals rather than risk. We are currently looking at cleanup goals between 5-15ppb.
- 6) Once in groundwater, MTBE is extremely difficult to remediate. It's Henry's Law coefficient is very low which means that MTBE prefers to stay in the aqueous phase rather than being sorbed or stripped out of water. Air sparging will be relatively ineffective. We are currently evaluating biological and oxidation remediation techniques.
- 7) A simple risk assessment for all sites (like we are in the process of developing) will greatly help focus future resources.

My professional opinion is that MTBE and similar oxygenates should not be used at all in areas where groundwater is a potential drinking water supply. If it is used, engineering design and site operations (including active subsurface monitoring) should be carefully developed to minimize the potential for a release.

Curt



-----Original Message-----  
From: Pedley JF (Joanna) at MSXWHWTC  
Sent: Monday, November 02, 1998 8:24 PM  
To: Benton F R [Newcos]  
Cc: Stanley CC (Curtis) at MSXWHWTC; Mcarragher S (Steve) at OPC  
Subject: FW: MTBE IN GROUNDWATER - ISSUES BRIEF

Ron -  
As discussed earlier today, grateful for your comments (US perspective additions ?) on the attached. Also by copy to Curtis - please could you review also.

nb: Steve had some sections highlighted in red in his original. I have made a few first pass suggested mods which are in blue with strikeouts of the original in black. Please feel free to change my mods.

From: Joanna Pedley  
Equilon Enterprises LLC

Manager Fuels Technology  
Westhollow Technology Center - M2603  
Tel: 281 544 7795  
Fax: 281 544 8585  
email: jfpedley@shellus.com  
jfpedley@equilon.com

THIS COMMUNICATION PER APPLICABLE AGREEMENTS BETWEEN OUR RESPECTIVE COMPANIES

From: McArragher, Steve SIPC-OBMF/51  
Sent: Tuesday, October 27, 1998 8:30 AM  
To: Pedley, Joanna SHLOIL-; Lee, Rob SHLOIL-  
Cc: Wynne-Williams, William SIPC-OBX  
Subject: MTBE IN GROUNDWATER - ISSUES BRIEF

Joanna, Rob, as discussed with Rob last week, we are starting to worry about the MTBE contamination issue outside

EQ 033388

USA. We have heard concerns in Scandinavia, and now it looks as if Brasil may also have some problems. We have put together an "Issues Brief" intended for Shell company management, and a set of Q&As for external use if necessary. As this is very much a US led issue, we would be grateful for some advice and comments from Equilon. I understand that Curtis Stanley is the expert, but have not approached him directly. What we are looking for is really a political steer, especially on questions like the number of leaking tanks in USA vs. Europe. I would be grateful if you could ask the appropriate contacts in Equilon to look at these documents and let us have comments.

<< File: MTBE issues brief v4.doc >> << File: MTBE Q&As v5.doc >>

With Best Regards

Steve McArragher - OBMF/33

Standard Setting - Gasoline

Oil Products - Strategy and Business Services

Shell International Petroleum Co.

Shell Centre, LONDON, SE1 7NA, UK

Tel 44-171-934-5457 Fax 44-171-934-6014

Internet: Steve.J.S.McArragher@OPC.shell.com

# **EXHIBIT 11**



# **MTBE RELEASE SOURCE IDENTIFICATION AT MARKETING SITES**

**A Study Conducted for EUSA ESD by  
Exxon Research & Engineering Company**

**3/30/99**

**By: A. E. Liguori  
A. C. Woerner  
A. M. Calderon**

**CONFIDENTIAL:** This document is subject to the September 21, 1999 Stipulated Protective Order entered by the San Francisco Superior Court, Case No. 99912

**EXLIGU 07255**

**MTBE RELEASE SOURCE IDENTIFICATION AT MARKETING SITES  
(A STUDY CONDUCTED FOR EUSA ESD)**

## **I. Background**

### **a. Study Basis**

In August 1998, EUSA Environmental and Safety Division (ESD) requested Exxon Research and Engineering Company to conduct a study identifying potential release sources of the gasoline additive Methyl-Tertiary-Butyl Ether (MTBE) at Exxon retail marketing sites. Interest in identifying these potential sources is important to EUSA, as well as most other U.S. petroleum marketing companies, because MTBE contamination is increasingly being found in surface and ground waters near gasoline service stations, and has been identified as a potential threat to public drinking water supply systems. By identifying the potential release sources, it is expected that all necessary and appropriate corrective measures can be taken so that accidental releases of MTBE into the subsurface environment can be prevented.

The objective of this study was to evaluate and categorize the extent and sources of MTBE contamination in soils and ground water at Exxon retail sites. A related objective is for EUSA to use results from this study to assist industry regulatory advocacy efforts with various state and federal environmental agencies. These agencies (with the state of California most notable) are addressing growing public concerns about potential MTBE human health effects, and are enacting regulations to require significant MTBE remediation programs and possibly the elimination of its use as a gasoline additive.

### **b. MTBE Contamination Issues at Marketing Retail Sites**

Methyl tertiary-butyl ether (MTBE) is present in gasoline as an octane enhancer (concentrations up to 9% by volume) or as an oxygenate to reduce ozone and carbon monoxide levels in air (concentrations 11-15% by volume). The presence of MTBE found in surface, ground and drinking waters has been increasing. There are several reasons why increased MTBE presence can be a concern:

- MTBE behaves differently than other gasoline constituents, i.e. it is relatively:
  - more soluble in water,
  - more volatile from product to air,
  - less volatile when dissolved in water to air
  - less likely to adsorb to soil or organic carbon
  - relatively more resistant to biodegradation.
- There is an increase in awareness since the public can easily detect its existence
  - Taste and odor detectable threshold levels are in the ppb ranges (15-180 ppb)
- Small leaks of gasoline (1 teaspoon) can translate into MTBE ground water concentrations above the taste and odor detectable threshold levels. A standard

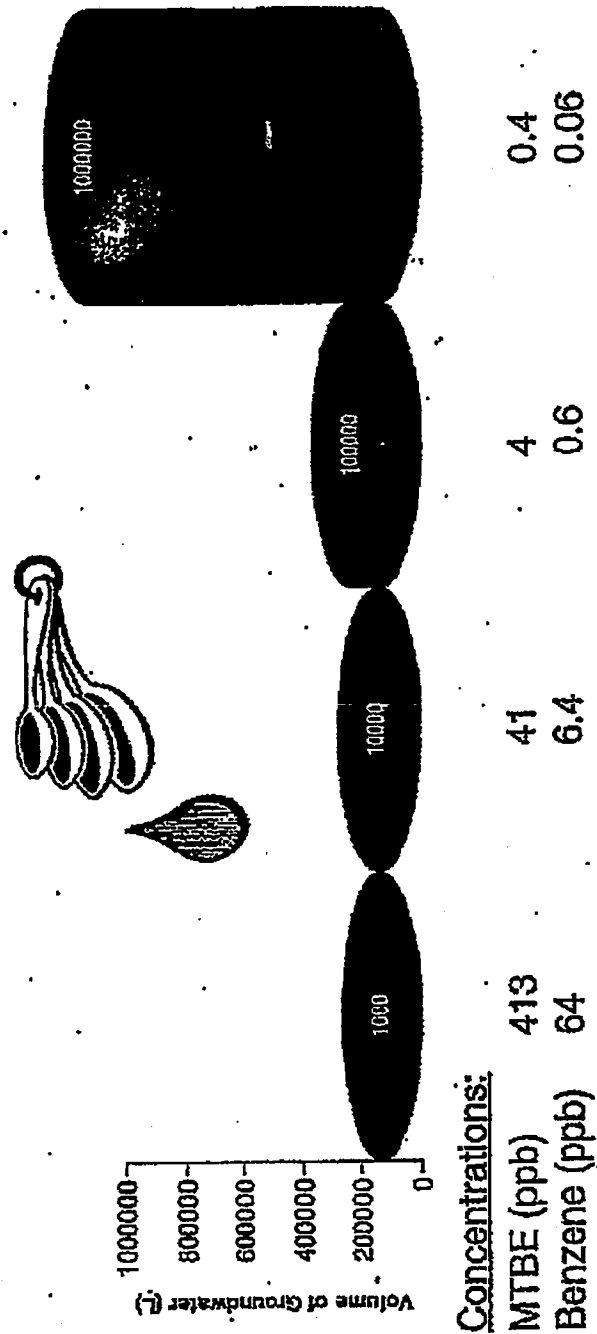
-2-

CONFIDENTIAL: This document is subject to the September 21, 1999 Stipulative Protective Order entered by the San Francisco Superior Court, Case No. 99912

EXLIGU 07257

## Figure I-1: Impact of Small Releases

1 Teaspoon of Gasoline ~ 5 ml  
 Assume 11.5 vol. % MTBE, 1.5 vol. % Benzene  
 Potential Impact on Groundwater a Function of Groundwater Volume



CONFIDENTIAL: This document is subject to the September 21, 1999 Stipulated Protective Order entered by the San Francisco Superior Court. Case No. 99912

EXLIGU 07259

# **EXHIBIT 12**

Bar D (DSEA)

From: Dickey, Hugh (JHDI)  
Sent: Wednesday, January 20, 1999 10:59 AM  
To: Hopkins, Mark (MHOP)  
Cc: Harrer, Bob (ROBD); Buscheck, Timothy (TIBU); Barber, Randy (RBBA); Sea, D (DSEA); Jessel, Al (AJJE); Gilson, Donald (DFGI); Hartwig, Jeff (JWHA); Freeberg, Clay (CRFR); Pierce, David (DWPI)  
Subject: RE: MtBE Fate in the Subsurface

Mark - Here's the final MTBE-UST white paper. I tried to be consistent with the spirit (if not the exact wording) of the comments I received from folks. Thanks to all. The only thing we need now is the Bill # from Feinstein's bill and it will be final.

Hugh

MTBE-UST White  
Paper (Final).doc

-----Original Message-----

From: Dickey, Hugh (JHDI)  
Sent: Monday, January 18, 1999 8:05 AM  
To: Buscheck, Timothy (TIBU); Sea, D (DSEA); Barber, Randy (RBBA); Harrer, Bob (ROBD); Hopkins, Mark (MHOP); Jessel, Al (AJJE); Gilson, Donald (DFGI); Hartwig, Jeff (JWHA)  
Subject: RE: MtBE Fate in the Subsurface

Here's the first draft of the white paper we would like to use in DC to help lobby the Feinstein/Bilbray bills to remove the federal oxygenate mandate. This responds to the argument that OFA and other MTBE manufacturers make that it is "just a problem with the tanks". Please review and get me any comments you have by COB tomorrow. Thanks.  
Hugh

<< File: MTBE-UST White Paper.doc >>

-----Original Message-----

From: Buscheck, Timothy (TIBU)  
Sent: Tuesday, January 12, 1999 8:02 PM  
To: Dickey, Hugh (JHDI)  
Subject: MtBE Fate in the Subsurface

Hugh,

I've attached some material that should be suitable for your white paper.

Tim

<< File: MtBEtanks.doc >>

CH 001981

## Solving Problems from MTBE Contamination -

### It's Not Just Regulating Underground Tanks

Some have suggested that the problems observed with MTBE contamination of groundwater can be resolved by forcing gasoline manufacturers and retailers into more stringent underground storage tank requirements. They argue it's just the tanks - fix them from leaking, and the MTBE problem will go away. There are several reasons why this explanation over-simplifies the situation. While it is important to reduce the likelihood a release from underground tanks, the mandated use of oxygenates has had unintended consequences. The physical and chemical properties of MTBE (and thus its mobility and persistence in the environment differ markedly from other components of gasoline. These differences make MTBE (and other ethers and heavy alcohols) more likely to get into groundwater and problematic to contain and clean up when a release occurs. These differences include:

- MTBE is more volatile than many components in gasoline. This means it is more likely to evaporate into the atmosphere when a release occurs, which in turn can readily move into water vapor (and subsequent rainfall) in the atmosphere.
- MTBE and other oxygenates are orders of magnitude more soluble in water than other gasoline components. Oxygenates make up one of largest single components in gasoline (10-15% by volume). They have a strong affinity for and dissolve easily in water (rainfall, surface waters, groundwater)
- Other gasoline components in comparison, bond more strongly to soil, should a release occur. This greatly reduces the volume of groundwater requiring clean-up, by limiting the area impacted.
- MTBE does not biodegrade as readily as other gasoline components, increasing the volume of groundwater impacted and making it more difficult to clean up.

Researchers at the University of California - Lawrence Livermore Laboratory<sup>1</sup> have concluded:

MTBE has the potential to impact regional groundwater resources and may present a cumulative contamination hazard. To date, impacts of MTBE to public water systems have been limited and were similar in frequency to those of benzene. Based on historical data, future impacts of aromatic hydrocarbons, such as benzene to water supplies is not expected to be common, due to retardation and relative ease of biodegradation. In contrast, MTBE contamination may be a progressive problem due to the chemical's apparent recalcitrance and mobility. With a compound that appears both ubiquitous and recalcitrant, water resource management on the regional scale will become increasingly relevant.

<sup>1</sup> "An Evaluation of MTBE Impacts to California Groundwater Resources"; LLNL - June 11, 1998

These concerns on the mobility and persistence of MTBE in the environment are reinforced by a recent study by the state of Maine. The state found MTBE groundwater contamination from small spills of gasoline (e.g. a spill in a parking lot, or a car accident) – incidences that stood in contrast to the known historical causes of MTBE contamination e.g. point source discharges from leaking underground storage tanks.<sup>1</sup>

While MTBE and other oxygenates have been used for many years as gasoline blending components, it was only after the mandated use of oxygenates following the passage of the 1990 Clean Air Act Amendments, that oxygenates became as widely used as they are today. It is because of the differences in physical and chemical properties of MTBE that it is more likely to reach groundwater, as a result of incidental spills, overfills, and gasoline deliveries, *even without* underground storage tank leaks. Therefore, the detection of MTBE does not necessarily mean a tank is leaking. For example, MTBE has been found in low concentrations in lakes from rainfall runoff and recreational activities.

Congress passed requirements for owners and operators to upgrade their underground storage tanks, provide for leak detection, and provide for financial responsibility, should a release occur. These requirements became fully effective on January 1, 1999. As a company, Chevron began upgrading their tanks around the country in the early 1980's, years in advance of federal and state requirements. Over the years, Chevron has continued to go beyond federal requirements – for example, in the early 1990's Chevron decided to install double-walled tanks, even though they are not required, in all new and reconstructed service stations. In addition, last year Chevron began a nationwide program to further reduce the likelihood of releases of gasoline into the environment. This program includes evaluation and monitoring of the most sensitive sites where groundwater exists, checking lines and connections of pumps and tanks, and changing station operating procedures and housekeeping practices.

Even these steps, which go far beyond federal and state requirements, can't fully eliminate releases, nor change the physical and chemical properties of MTBE and other oxygenates when they do get in the environment. Further, additional control measures could take years to implement, without fully solving the problem. The solution is to allow refiners the flexibility to avoid putting MTBE into gasoline in the first place. California Cleaner Burning Gasoline, the cleanest burning gasoline in the world, can be produced with little or no oxygenates and still meet the state's strict air quality requirements. Congress should pass HR 11 and S ( ) which would allow California refiners this flexibility.

---

<sup>1</sup> "The Presence of MTBE and Other Gasoline Compounds in Maine's Drinking Water"; October 13, 1998



# **EXHIBIT 13**

## Legal Retention at MSXSOC

---

From: Stanley CC (Curtis) at MSXWHWTC  
Sent: Tuesday, February 02, 1999 6:28 PM  
To: Benton F R [Newcos]  
Subject: RE: Draft WSPA Q&A on MTBE

Ron,

The paper looks fine. You may, however, want to carefully consider what you say when the new tank upgrades are our first line of defense. While this is very true and the size of leaks has decreased substantially over the years, we are still finding MTBE at sites that have been upgraded. The presence of MTBE may not be due to a leak but could also be due to operational and construction factors.

Curt

-----Original Message-----

From: Benton F R [Newcos]  
Sent: February 02, 1999 7:48 AM  
To: Kulakowski James M [Texaco]; Olejnik Larry J [Newcos]; Hancock Steve R [Newcos]; Molina Bert [Newcos]; Meeuwse Mike J [Newcos]; Stanley CC (Curtis) at MSXWHWTC  
Subject: Draft WSPA Q&A on MTBE

Please let me know if you have any input/concerns.

-----Original Message-----

From: DMFog@aol.com (SMTP:DMFog@aol.com)  
Sent: Friday, January 29, 1999 7:34 PM  
To: fbenton@equiva.com  
Subject: Oopel

Ron:

I'm a cyber-dummy. Accidentally pushed the delete instead of the print button on your email comment on the MTBE Q&A. Please resend. Attached is the latest draft which reflects all other comments.

Dave << File: Q&A.DOC >>

EXHIBIT

56-99es  
STAWKEY 12a

**Legal Retention at MSXSOC**

**From:** Marshall GR (Glen) at MSXSOPC  
**Sent:** Friday, May 29, 1998 5:36 PM  
**To:** Stanley CC (Curtis) at MSXVHWTC  
**Cc:** Chistolini C. Wayne [STAR]  
**Subject:** RE:

We (Shell) are also moving on said focus. "Achilles Heel" of systems has always been the "Bubba-factor".....the best intentions of hardware manufacturers and designers being ultimately defeated by poor installation and maintenance practices. Have been working last 2 years with Oy U-Cont (Varkaus, Finland) and Trusco Tanks (Fresno, CA) on a modular UST system manufactured in a factory (controlled environment) by properly trained personnel under constant supervision and inspection. Initial evaluations indicate a significantly more reliable system installed with roughly 20%+ savings in total project time and costs (related to UST portion of project). LA City Fire loved concept. Have two projects in for permits in LA Basin now. Coupled with our "Compliance Management Concept" (Veeder-Root Simplicity), overall concept could provide significant movement towards what UST system operation should have been all along. Advise if further concept details desired.

**Glen R. Marshall, P.E.**  
Staff Engineer  
Marketing Engineering  
Shell Oil Products Company  
TSP-1138  
Office: (713) 241-1452  
Fax: (713) 241-7166  
Beeper: (800) 342-4033  
Shell ELS: EM10138 @ MSXSOPC  
Internet: grmarshall@shellus.com

-----Original Message-----

**From:** Stanley CC (Curtis) at MSXVHWTC  
**Sent:** Friday, May 29, 1998 9:03 AM  
**To:** Marshall GR (Glen) at MSXSOPC  
**Subject:** FW:

Glen,

I told API that they had better have a project on slate to evaluate existing systems and new system design, installation, and operations. I already have a good idea what Santa Clara is going to find and if the industry isn't ready with an adequate response/solution, we are all going to look bad. I foresee many agencies requiring extensive groundwater monitoring systems to evaluate whether or not MTBE is being released into the environment, especially in environmentally sensitive areas (near wells, fractured bedrock, etc.).

**Curtis C. Stanley**

Environmental Technology Directorate - Soil and Groundwater  
Westhollow Technology Center  
(phone-@2) 281-544-7675 (fax-@) 281-544-8727  
e-mail: ccstanley@shellus.com

(This communication per applicable agreements between our respective companies.)

-----Original Message-----

**From:** Judy Shaw [SMTP:shaw@api.org] <mailto:[SMTP:shaw@api.org]>  
**Sent:** Friday, May 29, 1998 8:57 AM  
**To:** Al Jessel; Brian Harney; C. Fairbrother; Carol Fairbrother; Curt Stanley; Dave Peirce; David Smith; Don Gilson; Eric Vogt; Gene Mancini; Georgia Callahan; Gerry Raabe; Gweneyette Broussard; James Rocco; Jeff Sickenger; Jim Stevenson; John Taunton; Lee Hoffman; Mark Saperstein; Mary Kate Kell; Mike Lobue; Mike Wang; Ned Seppi; Ron Benton; Tim Buscheck; William Doyle  
**Cc:** Alexis Steen; Bill Bush; Bill Frick; Bob Greco; Bruce bauman; Carol Henry; Chuck Krambuhl; David Deal; David Lax; Debi Tulou; Dee Gavora; Eldon Rucker; Howard Feldman; Jim Williams (MDM); Karen Inman; Kim Ashton; Larry Magni; Marc Meteyer; Martha Jordan; Molly Sinclair; Rick Brown; Robert Barter; Ron Chittim; Theresa Pugh; Tom Lareau; Valerie Ughetta  
**Subject:**

You need to look at the following; it relates to the source identification /protection discussion we had the other day.

SH 032897

# **EXHIBIT 14**

Legal Retention at MSXSOC

Marshall GR (Glen) at MSXSOPC  
 Friday, May 29, 1998 5:38 PM  
 Stanley CC (Curtis) at MSXVHWTC  
 Chistolini C. Wayne [STAR]  
 RE:

Subject:

We (Shell) are also moving on said focus. "Achilles Heel" of systems has always been the "Bubba-factor".....the best intentions of hardware manufacturers and designers being ultimately defeated by poor installation and maintenance practices. Have been working last 2 years with Oy U-Cont (Varkaus, Finland) and Trusco Tanks (Fresno, CA) on a modular UST system manufactured in a factory (controlled environment) by properly trained personnel under constant supervision and inspection. Initial evaluations indicate a significantly more reliable system installed with roughly 20%+ savings in total project time and costs (related to UST portion of project). LA City Fire loved concept. Have two projects under permits in LA Basin now. Coupled with our "Compliance Management Concept" (Veeder-Root Simplicity), overall concept could provide significant movement towards what UST system operation should have been all along. Advise if further concept details desired.

Gen R. Marshall, P.E.

Sr. Engineer  
 Marketing Engineering  
 Shell Oil Products Company  
 MSX 1138

Office: (713) 241-1452  
 Fax: (713) 241-7166  
 Telex: (800) 342-4033  
 Shell ELS: EM10138 @ MSXSOPC  
 Internet: gmarshall@shellus.com

-----Original Message-----

From: Stanley CC (Curtis) at MSXVHWTC  
 Sent: Friday, May 29, 1998 8:03 AM  
 To: Marshall GR (Glen) at MSXSOPC  
 Subject: FW:

Glen,

I told API that they had better have a project on slate to evaluate existing systems and new system design, installation, and operations. I already have a good idea what Santa Clara is going to find and if the industry isn't ready with an adequate response/solution, we are all going to look bad. I foresee many agencies requiring extensive groundwater monitoring systems to evaluate whether or not MTBE is being released into the environment, especially in environmentally sensitive areas (near wells, fractured bedrock, etc.).

Curtis C. Stanley

Environmental Technology Directorate - Soil and Groundwater

Westhollow Technology Center

(phone-@) 281-544-7675 (fax-@) 281-544-8727

e-mail: cstanley@shellus.com

(This communication per applicable agreements between our respective companies.)

-----Original Message-----

From: Judy Shaw [SMTP:shaw@apl.org] <mailto:SMTP:shaw@apl.org>  
 Sent: Friday, May 29, 1998 8:57 AM  
 To: Al Jessel; Brian Hamey; C. Fairbrother; Carol Fairbrother; Curt Stanley; Dave Peirce; David Smith; Don Gilson; Eric Vogt; Gene Mancini; Georgia Callahan; Gerry Raabe; Gweneyette Broussard; James Rocco; Jeff Sickenger; Jim Stevenson; John Taunton; Lee Hoffman; Mark Saperstein; Mary Kate Kell; Mike Lobue; Mike Wang; Ned Seppl; Ron Benton; Tim Buscheck; William Doyle  
 Cc: Alexis Steen; Bill Bush; Bill Frick; Bob Greco; bruce bauman; Carol Henry; Chuck Krambuhl; David Deal; David Lax; Debi Tulou; Dee Gavora; Eldon Rucker; Howard Feldman; Jim Williams (MDM); Karen Inman; Kim Ashton; Larry Magni; Marc Meteyer; Martha Jordan; Molly Sinclair; Rick Brown; Robert Barter; Ron Chittim; Theresa Pugh; Tom Lareau; Valerie Ughetta  
 Subject:

You need to look at the following; it relates to the source identification/protection discussion we had the other day:

SH 032897

# **EXHIBIT 15**

**Legal Retention at MSXSOC**

From: Marshall Glen R (Newcos)  
Sent: Friday, March 12, 1999 2:47 AM  
To: Stanley CC (Curtis) at MSXWHWTC  
Subject: RE: Draft Agenda; Roster; Info Items

Already discussed details with Mike Barsa twice. '98 upgrade work will have no effect on MTBE issues. Any system that was going to have problems is still going to have problems. Upgrades addressed inadvertent spills and releases, not root causes of tank or line leaks. Also, all R&D work I'm familiar with indicates that MTBE will have no effect on same.

**Glen R. Marshall, P.E.**

Staff Coordinator  
Technical Services - Engineering  
**Equiva Services, L.L.C.**  
Shell + Texaco + Saudi Aramco

9:80 Schedule "A"  
Office: (281) 874-4857  
Fax: (281) 874-7979  
Beeper: (800) 342-4033  
Alliance ELS: Marshall GR (Glen)  
Internet: GRMarshall@Equiva.com

Address: Equiva Services, L.L.C.  
12700 Northborough Drive  
Suite 300C12  
Houston, TX 77067

-----Original Message-----

From: Stanley CC (Curtis) at MSXWHWTC (SMTP:CS193653@MSXWHWTC.SHELL.COM)  
Sent: Thursday, March 11, 1999 3:35 AM  
To: Marshall Glen R (Newcos)  
Subject: RE: Draft Agenda; Roster; Info Items

Glen,

This is just an fyi. The new MTBE counsel (outside attorney) is interested in hearing your opinion on tank upgrades in relation to MTBE release prevention. They will contact you in the near future.

Curt

-----Original Message-----

From: Marshall Glen R (Newcos)  
Sent: March 10, 1999 9:32 PM  
To: Stanley CC (Curtis) at MSXWHWTC  
Subject: RE: Draft Agenda; Roster; Info Items

Any specific support needs from me or my department? I'm not officially on any of the attached committees to my knowledge, have out-of-state vendor coming in on 3-31, and will only be in office 3-29 thru 4-1. Due to current travel commitments, will not be back in office on regular basis until roughly 4-8.

**Glen R. Marshall, P.E.**

Staff Coordinator  
Technical Services - Engineering  
**Equiva Services, L.L.C.**  
Shell + Texaco + Saudi Aramco

9:80 Schedule "A"  
Office: (281) 874-4857  
Fax: (281) 874-7979  
Beeper: (800) 342-4033  
Alliance ELS: Marshall GR (Glen)  
Internet: GRMarshall@Equiva.com

Address: Equiva Services, L.L.C.  
12700 Northborough Drive  
Suite 300C12  
Houston, TX 77067

-----Original Message-----

From: Stanley CC (Curtis) at MSXWHWTC (SMTP:CS193653@MSXWHWTC.SHELL.COM)  
Sent: Wednesday, March 10, 1999 12:48 PM  
To: Allen Register; Arlene Warden; Brad Boschetto; Bruce Krawinghaus; Chen Chiang; Chris Neville; Christine White; Chuck Ueder; Cindy Delaney; Daniel Farnier; Ed Hsu; Edward Dinkfeld; Erik Hansen; F Benton; Felicia Federico; George Dealey; George Devaux; Gerard Spindler; Glen Marshall; Gwendolynne Broussard; Heana Rhodes; James Michalak; Jerry Ivia; Joe Salenbro; Jonathan Miller; Kathleen Gilmore; Ken Danner; Ken Springer; Marjorie Hong; Michael Gallagher; Otto Meyers; Paul Sun; Pete Parker; Phil Daly; Phil Dorn; Richard Lewis; Rick Wotho; Robert Dedoes; Robert Etlinger  
Subject: FW: Draft Agenda; Roster; Info Items

FYI

Curt

SH 022667